KHRS
The Korean Hair Research Society

2021년 제17차

대한모발학회 학술대회

2021 17th Annual Meeting of the Korean Hair Research Society

2021년 5월 30일(일) 09:20 - 17:40

삼정호텔

제17차

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17th Annual Meeting of
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삼정호텔

The Korean Hair Research Society

Welcome message

안녕하십니까?

COVID-19 사태의 장기화로 인한 여러 어려움속에서도 각자의 분야에서 전력을 다하고 계시는 회원 여러분께 깊은 경의를 표합니다.
환자 진료와 회원간 상호 교류는 여전히 어렵지만, 학문의 발전은 COVID-19와 상관없이 더없이 빠른 성과를 보이고 있습니다. 이에 대한모발학회는 회원 여러분께 연구 및 진료에서 도움이 되도록, 기초연구 및 임상 분야의 새로운 연구성과를 중심으로 정기 학술대회를 준비하였습니다.

이번 제17차 대한모발학회 학술대회는 2021년 5월 30일 서울 역삼동 삼정호텔에서 개최되며, COVID-19 방역 지침에 맞추어 온라인과 오프라인을 병행하는 학회로 진행될 예정입니다.

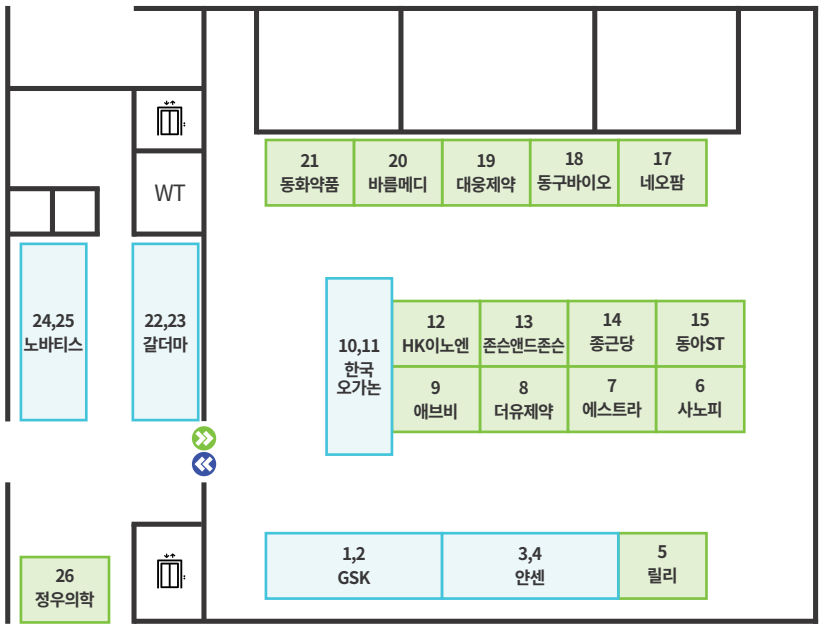
본 학술대회에서는 국제모발학회(The International Federation of Hair Research Societies, IFHRS)의 의장인 Wilma F. Bergfeld의 특강과 원형탈모증에 치료제로 기대되는 JAK 억제제에 대해 탁월한 연구를 수행하신 Angela Christiano 교수를 포함한 국내외 여러 석학들을 초청하여 모발 분야에 대한 최신 지견을 공유하고자 합니다. 임상적으로 가장 중요한 남성형탈모증과 원형탈모증 분야에서 적용되고 있는 최신 치료법도 준비하였고, 최근 가장 관심을 받는 분야인 scalp microbiome과 hair stem cells에 대해서도 해당분야 산학계에 종사하는 국내외 전문가들을 초청하여 활발한 토론을 준비하고 있습니다.
이번 학회를 준비하는데 노력해주신 대한모발학회 상임이사진과 참여를 수락하신 연자분들과 좌장분들께 다시한번 깊은 감사의 인사를 드리며, 회원 여러분께 유익한 기회가 되기를 기원합니다.

끝으로 COVID-19가 종료될 때까지 항상 건강하시고, 가능한 많은 분이 직접 학술대회장에 참석할 수 있게 되기를 소망합니다.
감사합니다.

2021년 5월
대한모발학회 회장 **최광성**

학회장 안내도

부스 전시 안내



부스번호	회사명
10,11	한국오가논
1,2	GSK
22,23	갈더마코리아
24,25	한국노바티스
3,4	한국얀센
5	한국릴리
6	사노피젠자임
7	에스트라
8	더유제약
9	애브비
12	HK이노엔
13	존슨앤드존슨
14	종근당
15	동아ST
21	동화약품
20	바름메디
19	대웅제약
18	동구바이오
17	네오팜
26	정우의학

Program

09:00-09:20	**Registration**
09:20-09:30	**Opening ceremony** Opening Remarks **Gwang Seong Choi**, President, KHRS
09:30-11:30	**Session 1. Alopecia areata** Chair **Won-Soo Lee**, Yonsei Wonju University Chair **Gwang Seong Choi**, Inha University
09:30-10:00	What is the International Federation of Hair Research Societies (IFHRS)? and What is it's association with the World Congress of Hair Research **Wilma F. Bergfeld**, Cleveland Clinic
10:00-10:30	JAK inhibitors: New treatment approaches for alopecia areata **Angela M. Christiano**, Columbia University
10:30-10:50	What's new in the genetics of alopecia areata? **Jung Eun Kim**, The Catholic University of Korea
10:50-11:10	Deep learning algorithms for the assessment of alopecia areata **Solam Lee**, Yonsei Wonju University
11:10-11:30	Clinical course of alopecia areata: Is it better or worse than you think? **Yong Hyun Jang**, Kyungpook National University
11:30-11:50	**Coffee break**
11:50-12:50	**Session 2. AmorePacific symposium (scalp microbiome)** Chair **Hoon Kang**, The Catholic University of Korea Chair **Moon-Bum Kim**, Pusan National University
11:50-12:10	Introduction to skin microbiome **Woo Jun Sul**, ChungAng University
12:10-12:30	What's new in scalp microbiome? **Jin Park**, Chonbuk National University
12:30-12:50	Development of novel cosmetic active for healthy scalp based on clinical microbiota analysis **Yonghee Lee**, SCALP BIO LAB, AMOREPACIFIC R&D Center
12:50-13:10	**Publication ceremony for "Hair disorders: Androgenetic alopecia" & Group photo**

13:10-14:10	Luncheon symposium / KHRS board meeting Proven long-term safety of finasteride over 20years; Unraveling truth from myth **Do-Young Kim**, Yonsei University
14:10-15:40	Session 3. **Hair stem cells** Chair **Young Kwan Sung**, Kyungpook National University Chair **Ohsang Kwon**, Seoul National University
14:10-14:40	Origin and induction process of hair follicle stem cells **Hironobu Fujiwara**, RIKEN Center for Biosystems Dynamics Research, Japan
14:40-15:00	How stem cells juggle lineage choice: Epigenetic mechanisms of tissue regeneration of adult hair follicle stem cell **Hanseul Yang**, KAIST
15:00-15:20	Cell therapy using dermal papilla cells **Jong-Hyuk Sung**, Yonsei University
15:20-15:40	The domain specific murine skin pattern and hair cycle evolution **Ji Won Oh**, Kyungpook National University
15:40-16:00	Coffee break
16:00-17:30	Session 4. **Patterned hair loss** Chair **Kyu Han Kim**, Seoul National University Chair **Dong-Youn Lee**, Sungkyunkwan University
16:00-16:30	Minoxidil, Mechanism of action and utility in the treatment of pattern hair loss **Rodney Sinclair**, Sinclair Dermatology, Australia
16:30-16:50	Complementary and alternative treatments for androgenetic alopecia **Young Lee**, Chungnam National University
16:50-17:10	What's new in hair transplantation? **Chang Hun Huh**, Seoul National University
17:10-17:30	Comorbidities in patients with androgenic alopecia ; It's a bit more complicated than you think **Jee Woong Choi**, Ajou University
17:30-17:40	Closing remarks
17:40-	KHRS general assembly

목차

Session 1. Alopecia areata

Session 2. AmorePacific symposium (scalp microbiome)

Luncheon symposium

17th Annual Meeting of the Korean Hair Research Society

Session 3. Hair stem cells

Session 4. Patterned hair loss

Poster

Session 1.

Alopecia areata

09:30 - 11:30

Chair Won-Soo Lee, Yonsei Wonju University
Chair Gwang Seong Choi, Inha University

The Korean Hair Research Society

bergfew@ccf.org

Wilma Fowler Bergfeld MD, FACP, FAAD, FASDP
Cleveland Clinic Foundation: Departments Of Dermatology and Pathology;

APPOINTMENT

Cleveland Clinic Foundation: Departments
Of Dermatology and Pathology;
Senior Dermatologist
Director, CCF Dermatopathology Fellowship
Director, 1972-2006, Section of Dermatopathology,
Department of Pathology;
Co-Director, Section of Dermatopathology 2006-2015
Departments of Dermatology and Pathology
Emeritus Director of Dermatopathology 2015-
Past Head, Section Dermatological Research, Department of Dermatology;
International Dermatology/DP Consultant

(Dermatology & Pathology)
Professor, Cleveland Clinic Educational Foundation (1990-2004)
Case Western University: Department of Dermatology,
Clinical Associate Professor (Lerner School of Medicine)
Past Dermatology Consultant, CCF Sports Health

EDUCATION

College of William and Mary, BS, 1956-60
Postgraduate, Temple University Medical School, MD, 1960-64
Internship, Cleveland Clinic Hospital, 1964-65
Fellowship, Dermatology, Cleveland Clinic Foundation, 1965-68
Earle Osborne Dermatopathology Fellow, 1971-72 (1.5 year), AFIP with Elson B Helwig MD

CERTIFICATION

HIPPA Certification, 2003, 2005, 2012-2015, 2017-2024
IRB Research Certification, 2003-2012- 2015, 2017-
CITI 2009-2012- 2015, 2018- 2022
CLIA 2009-2015- 2019
Comet Refresher 2008, 2009, 2012, 2015, 2016
GMS Principal Investigator Training I, 2008
CCF Investigator Research Educational Certificate 2009, 2016

2009 National Patient safety Goals/CCF: Joint Commission on Accreditation of Healthcare organizations
AMA Physician Recognition Award, March 2005-March 2009
AAD Continuing Medical Education Award -2008
Diplomat, National Board of Medical Examiners, 1965
Diplomat, American Board of Dermatology, 1969
Medical License: State of Ohio, 1964-current; State of Maryland, 1973-1990
Certified: Dermatopathology Boards, 1974
Member, American Federation of TV and Radio Artists, H2545; 1996-9

What is the International Federation of Hair Research Societies, and What is it's association with the World Congress for Hair Research?

Wilma F. Bergfeld, MD, FAAD
Professor of Dermatology and Pathology
Cleveland Clinic, Cleveland, Ohio, USA
Chair, International Federation of Hair Research Societies

The past 3 decades have seen tremendous advancement in the field of hair research, represented by the identification of hair follicle stem cells, and the establishment of hair follicle immune privilege concept, the development of in vivo hair follicle reconstitution assays and the deeper dissection of pathophysiology of hair loss disorders leading to the development of novel therapeutic approaches. These advances are largely due to organized global medicine and dermatologic research.

The International Federation of Hair Research Societies (IFHRS) is a global federation comprised of regional and national non-profit hair research societies that have promoted the sharing of clinical and basic research to further the field of hair research. The original five founding societies have worked independently within their regions and together on a global front to promote and fund research of hair disorders, encourage collaboration between researchers, educate and disseminate information at conferences, and to plan the biennial Hair Research Congresses.

Currently, IFHRS is made up of 8 international societies. The original 5 societies are: Europe (EHRS), The Americas (AHRS), Japan (SHRS), Australasia (AHWRS), and Korea, (KHRS). In 2019, three additional societies were accepted into the Federation. They include: The Ukraine (UHRS), China (CHRS), and Russia (RHRS). Each society has its own distinctive activities and holds regular meetings. However, the biennial World Congress for Hair Research, hosted on a rotational basis between the IFHRS member societies, is the culmination of sharing the latest basic and clinical science, renewing international friendships, and fostering collaborative research. The IFHRS establishes the rotation of world congresses. The next World Congress for Hair Research 2022 (https://hair2022.org/) will be in Melbourne, Australia, April 22-25. I extend to you all the meeting invitation from the director, Professor Rodney Sinclair. You are invited to attend.

Session 1. Alopecia areata

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Angela M. Christiano, Ph.D.
Richard & Mildred Rhodebeck Professor
Departments of Dermatology and Genetics & Development
Acting Chair and Director of Research, Department of Dermatology
Columbia University College of Physicians & Surgeons

EDUCATION

1983-1987 Douglass College
Rutgers University
New Brunswick, New Jersey
B.A. in Biology

1987-1990 Rutgers University
UMDNJ - Graduate School of Biomedical Sciences Joint Graduate Program in Microbiology
New Brunswick, New Jersey
M.S. in Microbiology & Molecular Genetics

1987-1991 Rutgers University
UMDNJ - Graduate School of Biomedical Sciences Joint Graduate Program in Microbiology
New Brunswick, New Jersey
Ph.D. in Microbiology & Molecular Genetics

FELLOWSHIPS

1991-1992 Post-Doctoral Fellow
Department of Dermatology
Thomas Jefferson University
Jefferson Medical College
Philadelphia, Pennsylvania

1992-1993 Research Instructor
Department of Dermatology
Thomas Jefferson University
Jefferson Medical College
Philadelphia, Pennsylvania

1997-1999 Fellowship in Clinical Molecular Genetics
Division of Clinical Genetics
Department of Pediatrics
Presbyterian Hospital
New York, NY

2013-2015 Provost Leadership Fellow
Columbia University
New York, NY

BOARD CERTIFICATION

American Board of Medical Genetics
Certification in Clinical Molecular Genetics
Fellow, American College of Medical Genetics
2002 - Present

ELECTED MEMBERSHIP

2020-present Member, National Academy of Sciences

SOCIETY LEADERSHIP

Society for Investigative Dermatology President, 2016-2017
Immediate Past President, 2017-2018

JAK inhibitors in the treatment of alopecia areata

Angela M. Christiano, PhD

Department of Dermatology Columbia University, College of Physicians and Surgeons, New York, NY, 10032

Alopecia areata is an autoimmune disease driven by effector cytolytic T cells (CTLs) that infiltrate the hair follicle. We previously showed that CTL, IFN-γ and common γ-chain (γc) cytokine gene signatures are significantly upregulated in lesional skin from both humans and mice with AA. These cytokines utilize the downstream JAK-STAT signaling pathway for mediating immune responses in AA, and therapeutic targeting of these cytokine pathways using first-generation JAK 1/2 inhibitors (Ruxolitinib and Baricitinib) and pan-JAK inhibitor (Tofacitinib) have shown efficacy in the treatment of human AA and in the C3H/HeJ mouse grafted model. Our recent work indicates a dominant role of JAK1 or JAK3 over JAK2 in the pathogenesis of lesional AA skin, and selectively targeting JAK1 or JAK3 is sufficient to reverse AA. We will discuss the efficacy of next-generation JAK inhibitors in the treatment of AA, as well as recent research identifying new therapeutic targets for patients with AA..

Session 1. Alopecia areata

mdkjeun@naver.com

Jung Eun Kim

Department of Dermatology, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea

Education and Training

2004	M.D., College of Medicine, The Catholic University of Korea
2004-2005	Internship, Department of Dermatology, Catholic Medical Center
2005-2009	Resident, Department of Dermatology, Catholic Medical Center
2008-2012	Ph.D. Department of Dermatology, Graduate School of Medical Science, The Catholic University of Korea

Current and Past Professional Positions

2009-2011	Clinical Instructor, Dermatology, Catholic Medical Center
2011-2015	Clinical Assistant Professor, Department of Dermatology, St. Paul's Hospital
2016-2019	Assistant Professor, Department of Dermatology, Eunpyeong St. Mary's Hospital
2020 -present	Associate Professor, Department of Dermatology, Eunpyeong St. Mary's Hospital

Society Memberships

Korean Dermatological Association
The Korean Atopic Dermatitis Association
The Korean Hair Research Society
The Korean Society of Dermatopathology
Korean Society of Cutaneous Mycology

Featured Publications

1. Int J Mol Sci. 2021 Apr 27;22(9):4581. Mesenchymal Stem Cells Antagonize IFN-Induced Proinflammatory Changes and Growth Inhibition Effects via Wnt/β-Catenin and JAK/STAT Pathway in Human Outer Root Sheath Cells and Hair Follicles
2. Exp Dermatol 2020 Mar;29(3):265-272. Effects of mesenchymal stem cell therapy on alopecia areata in cellular and hair follicle organ culture models
3. Int J Mol Sci. 2020 Jul 20;21(14):5137. The Effect of JAK Inhibitor on the Survival, Anagen Re-Entry, and Hair Follicle Immune Privilege Restoration in Human Dermal Papilla Cells
4. Lasers Surg Med 2017 Dec;49(10):940-947. Wnt/β-catenin and ERK pathway activation: A possible mechanism of photobiomodulation therapy with light-emitting diodes that regulate the proliferation of human outer root sheath cells

Major Interests

Atopic Dermatitis, Alopecia areata, Hair, Stem cells

What's new in the genetics of alopecia areata?

Jung Eun Kim
Department of Dermatology, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea

Alopecia areata (AA) is among the most highly prevalent human autoimmune diseases, leading to disfiguring hair loss due to the collapse of immune privilege of the hair follicle and subsequent autoimmune attack. The genetic basis of AA is largely unknown. The first genome-wide association study (GWAS) revealed 10 susceptibility loci as follow:

- Human leukocyte antigen (HLA) locus
- NKG2D-mediated cytotoxic T-cells ligand: ULBP3/ULBP6
- Treg functions: IL2RA, IL2/IL21, CTLA4 and Eos
- Within the hair follicle
    - STX17 :end-organ autophagy
    - PRDX5 : oxidative stress
    - IL13/IL4 and KIAA0350/CLEC16A

As functional studies confirmed that ULBP3 was aberrantly upregulated as a danger signal on the hair follicles of AA patients, NKG2D+ cytotoxic T-cells have been considered as the main pathogenesis of AA. A meta-analysis was performed including data for 2 GWAS and ImmunoChip study revealed some novel loci outside the MHC, which are BIM (autophagy), GARP (regulatory T cells) and LNK (tyrosine kinases and JAK signaling).

Dysregulation of these autophagy-related genes in hair matrix keratinocytes seem to cause early entry into dystrophic catagen in AA. Although the role of autophagy in the pathogenesis of AA is unclear, rare copy number variants of ATG4B, autophagy-related gene expression implicates its etiological role. Various genetic studies such as exome sequencing additionally enables to discover new pathogenic candidates of AA. Single nucleotide polymorphisms (SNPs), coding sequence insertions/ deletions, and canonical splice-site variants of several new genes have been found and suggested roles are as follow:

- TAP1 gene polymorphisms : endogenous antigen presentation pathways
- Increased expression of TLR7 and TLR9 : inflammatory mediator
- Copy number variants of MCHR2 gene, responsible for hair pigmentation was also reported in AA.

Gene expression profiling studies have revealed predominant signatures of the Interferon gamma pathway and its related cytokines, as well as a signature for cytotoxic T cells, which further refined the focus using small-molecule JAK inhibitors.

Session 1. Alopecia areata

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Solam Lee

Department of Preventive Medicine,
Yonsei University Wonju College of Medicine, Wonju, Korea

VUNO Inc. Seoul, Korea

Education

2008-2014 M.D., Yonsei University Wonju College of Medicine, Wonju, Korea

Current and Past Professional Positions

2015-2019 Resident in Dermatology,
Yonsei University Wonju Severance Christian Hospital, Wonju, Korea
2019-2021 Resident in Preventive Medicine (Epidemiology),
Yonsei University Wonju College of Medicine, Wonju, Korea
2021-Present Research Fellow, Department of Preventive Medicine,
Yonsei University Wonju College of Medicine, Wonju, Korea
2021-Present Medical Director, VUNO Inc., Seoul, Korea

Major Interests

Biostatistics, Artificial Intelligence

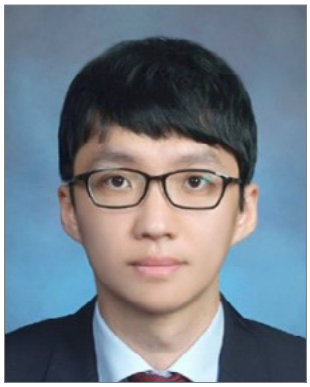
Deep learning algorithms for the assessment of alopecia areata

Solam Lee

Department of Preventive Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea

Although the assessment of hair loss in alopecia areata is crucial in patient care, the current approaches that depend on naked eye examinations are inaccurate and subjective. The study was to develop a deep learning model that can measure the extent of hair loss and validate its clinical benefit in patient assessment. In this retrospective study, a total of 2716 images taken in four standardized views were used to train and validate the convolutional neural network for segmentation. The Jaccard similarity index was 0.963 and 0.941 in segmentation of hair loss and scalp areas, respectively. The model successfully identified hair loss in most morphological subtypes of alopecia areata. In the reader study, with naked eye examination, the measurement error of eight dermatologists with respect to the ground truth and the interrater reliability across the participants were 9.3%p (95% confidence interval [CI], 9.0%p–9.6%p), and Cohen's κ was 0.570 (95% CI, 0.520–0.612). With the aid of the model, the error was 3.9% (95% CI, 3.8%p–4.1%p) and Cohen's κ was 0.918 (95% CI, 0.906–0.931), revealing significant improvements in both outcomes. Moreover, the explanatory power of the extent of hair loss for hair regrowth was significantly increased based on the integrated area under curve of 0.024 (95% CI, 0.013–0.034) when the aided measurements were used for fitting the Cox proportional hazard model. The deep learning model showed satisfactory performance in identifying hair loss and scalp areas. Although the current method could be improved for general use, this computer-aided measurement will enable assessing patients more accurately and objectively.

Session 1. Alopecia areata



Yong Hyun Jang, M.D., Ph.D.
Department of Dermatology, School of Medicine, Kyungpook National University

Education and Training:

1995-2001 Ajou University School of Medicine (MD), Suwon, Korea
2002-2004 Ajou University Graduate School of Medicine (MS), Suwon, Korea
2009-2011 Ajou University Graduate School of Medicine (PhD), Suwon, Korea

Current and Past Professional Positions:

2009-2011 Dermatology fellow, Ajou University Hospital, Suwon, Korea
2010.8 Visiting fellow, National skin center, Singapore
2011-2012 Dermatology fellow, Kyungpook National University Hospital, Daegu, Korea
2012-2013 Clinical assistant professor, Dermatology, Ajou University School of Medicine, Suwon, Korea
2019-2020 Research scholar, Keck School of Medicine, University of Southern California
2013- Assistant/Associate professor, Dermatology, Kyungpook National University School of Medicine, Daegu, Korea

Selected Publications

1: Jang YH et al. Systematic review and quality analysis of studies on the efficacy of topical diphenylcyclopropenone treatment for alopecia areata. J Am Acad Dermatol. 2017 Jul;77(1):170-172.

2: Jang YH et al. Increased blood levels of NKG2D+CD4+ T cells in patients with alopecia areata. J Am Acad Dermatol. 2017 Jan;76(1):151-153.

3: Jang YH et al. Long-Term Prognosis of Alopecia Totalis and Alopecia Universalis: A Longitudinal Study with More than 10 Years of Follow-Up: Better than Reported. Dermatology. 2017;233(2-3):250-256 -8.

4: Jang YH et al. Investigation on the role of necroptosis in alopecia areata: A preliminary study. J Am Acad Dermatol. 2016 Aug;75(2):436-9.

5: Jang YH et al. Alopecia Areata Progression Index, a Scoring System for Evaluating Overall Hair Loss Activity in Alopecia Areata Patients with Pigmented Hair: A Development and Reliability Assessment. Dermatology. 2016;232(2):143-9.

Clinical course of alopecia areata: Is it better or worse than you think?

Yong Hyun Jang, M.D., Ph.D.
Department of Dermatology, Kyungpook National University School of Medicine, Daegu, Korea

The clinical course of alopecia areata (AA) is unpredictable. Up to 50% of patients will recover within a year without treatment. However, the majority of AA patients will show an irregular relapsing-remitting course, with multiple episodes of hair loss. The major prognostic factors with clinical relevance include the extent and duration of the disease. Many therapeutic options exist for AA and the recommended treatment strategies are based on the age of the patient and the extent of the disease. Therapeutic modalities include topical minoxidil, topical and intralesional corticosteroids for mild AA, diphenylcyclopropenone (DPCP) and JAK inhibitors for severe AA. Unfortunately, to date, there is no approved cure provides complete hair regrowth, and all treatments are considered "off-label". For many reasons, including a high rate of spontaneous remission and paucity of randomized-controlled studies investigating treatment efficacy, it is difficult to assess therapeutic effects for AA. Moreover, long-term follow-up is not reported in many of the publications. Another important drawback is the great variation in treatment outcome evaluation. To minimize this factor, the Severity of Alopecia Tool (SALT) score has been used as a method for measuring the extent of scalp AA. Recently, our group introduced the Alopecia Areata Progression Index (AAPI) which seems to represent a system capable of quantifying overall hair loss activity in AA patients with different severity. In this presentation, I will discuss the clinical course, prognosis, evaluation of treatment, and measuring tools of AA.

Session 2.

AmorePacific symposium (scalp microbiome)

11:50 - 12:50

Chair Hoon Kang, The Catholic University of Korea
Chair Moon-Bum Kim, Pusan National University

The Korean Hair Research Society

Session 2. AmorePacific symposium (scalp microbiome)

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Woo Jun Sul
Department of Systems Biotechnology, Chung-Ang University, Korea

Education and Training

1994-2001 B.S. in Biology, Yonsei University
2001-2003 M.S. in Biology, Yonsei University
2005-2009 Ph.D., Michigan State Univeristy, USA
2010-2013 Post-Doc, Marine Biological Lab, USA

Current and Past Professional Positions

2013-2017 Assistant Professor, Chung-Ang University
2017- Associate Professor, Chung-Ang University

Awards

2009 The Ronald M. and Sharon Rogowski Fellowship (Michigan State University)
2014 The 5th KRIBB Awards – Young Scientist (The Microbiological Society of Korea)
2020 Medytox Awards (The Microbiological Society of Korea)

Society Memberships

The Microbiological Society of Korea
The Genetics Society of Korea
The Korean Society for Microbiology and Biotechnology

Featured Publications

Fragile skin microbiomes in megacities are assembled by a predominantly niche-based process. Science Advance, 2018
Collapse of human scalp microbiome network in dandruff and seborrheic dermatitis. Experimental Dermatology, 2017
Segregation of age-related skin microbiome characteristics by functionality, Scientific Reports, 2019
Structures of the Skin Microbiome and Mycobiome Depending on Skin Sensitivity, Microorganisms, 2020
Inferences in microbial structural signatures of acne microbiome and mycobiome, Journal of Microbiology, 2021

Major Interests

Skin microbiome, Microbial Ecology, Metagenomics

Introduction to skin microbiome

Woo Jun Sul
Chung-Ang University, Anseong, Republic of Korea

The cutaneous surface is inhabited by myriad bacteria, fungi, and viruses. We begin to understand how these microbial communities impact human's skin health and disease. The skin microbiota plays a vital role in educating the immune system as the cutaneous innate and adaptive immune responses can modulate the skin microbiota. Beside host intrinsic factors, the environmental factors including residential environments, also were thought to modulate skin microbiomes and eventually link to human health and disease. Here, I will show the examples of environmental factors can not only have a harmful impact on general skin health but also exacerbate skin diseases and microbiome studies differed by ages, dandruff, skin sensitivity, acne vulgaris, seborrheic dermatitis and etc.

Session 2. AmorePacific symposium (scalp microbiome)

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Jin Park

Department of dermatology, Jeonbuk (Chonbuk) National University Medical School, Jeonju, Korea

Education and Training

1997-2003	College of Medicine, Wonkwang University, Iksan, Korea
2007-2011	Resident, Department of Dermatology, Jeonbuk National University Hospital, Jeonju, Korea
2007-2009	M.S. in Dermatology, Jeonbuk National University, Jeonju, Korea
2013-2018	Ph.D. in Dermatology, Chonnam National University, Kwangju, Korea

Current and Past Professional Positions

2011-2012	Instructor, Department of Dermatology, Jeonbuk National University Medical School, Jeonju, Korea
2012-2015	Assistant Professor, Department of Dermatology, Jeonbuk National University Medical School, Jeonju, Korea
2015-2019	Associate Professor, Department of Dermatology, Jeonbuk National University Medical School, Jeonju, Korea
2020- present	Professor, Department of Dermatology, Jeonbuk National University Medical School, Jeonju, Korea
2019- present	Guest researcher, Cutaneous microbiome and inflammation section, Dermatology branch, NIAMS, NIH, Maryland, US

Awards

2018	Yong Investigator Award, Korean Society for Medical Mycology

Society Memberships

Korean Society of Dermatology
Korean Hair Research Society
Korean Society for Medical Mycology/Cutaneous Mycology

Featured Publications

Park J, Schwardt NH, Jo JH, Zhang Z, Pillai V, Phang S, Brady SM, Portillo JA, MacGibeny MA, Liang H, Pensler M, Soldin SJ, Yanovski JA, Segre JA, Kong HH. Shifts in the skin bacterial and fungal communities of healthy children transitioning through puberty. J Invest Dermatol (In press)

Harkins CP, MacGibeny MA, Thompson K, Bubic B, Huang X, Brown I, Park J, Jo JH, Segre JA, Kong HH, Rozati S. Cutaneous T-Cell Lymphoma Skin Microbiome Is Characterized by Shifts in Certain Commensal Bacteria but not Viruses when Compared with Healthy Controls. J Invest Dermatol. 2020 Nov 16:S0022-202X(20)32289-2. Epub ahead of print.

Hao L, Park J, Jang HY, Bae EJ, Park BH. Inhibiting Protein Kinase Activity of Pyruvate Kinase M2 by SIRT2 Deacetylase Attenuates Psoriasis. J Invest Dermatol. 2021 Feb;141(2):355-363.

Kwak HB, Yun SK, Kim HU, Park J. Pityriasis Amiantacea: An Epidemiologic Study of 44 Cases in Korean Patients. Ann Dermatol. 2020 Feb;32(1):83-87.

Park SK, Park SW, Yun SK, Kim HU, Park J. Tinea capitis in adults: A 18-year retrospective, single-centre study in Korea. Mycoses. 2019 Jul;62(7):609-616.

Major Interests

Alopecia, Skin microbiome

What’s new in scalp microbiome?

Jin Park
Department of dermatology, Jeonbuk National University Medical School, Jeonju, Korea

Human skin is an ecosystem that harbors a variety of commensal and pathogenic microbes, including bacteria, fungi, and viruses. Skin microbial communities vary among different skin sites and the topographical diversity of the skin bacterial and fungal communities result from spatial physiological attributes in human skin. Although sharing some characteristics with other skin sites, scalp present unique anatomical/physiological features such as lower pH, more blood vessels, and numerous pilosebaceous units, resulting in distinct microenvironments that can harbor and influence the skin microbial compositions. Especially, scalp hair follicles extending from skin surface to the dermis or subcutaneous tissue create a unique lipid-rich hydrophobic niche.

With the increase in skin microbiome studies, there has also been an expansion of the scalp microbiome studies under investigation using genomic sequencing. Several scalp microbiome studies from different populations have revealed the association of seborrheic dermatitis/dandruff with bacterial and fungal dysbiosis. While skin microbiome on the scalp surface have been relatively widely studied, the little is known about the hair follicle microbiome and its potential role in hair loss disorders. Recently, a few studies using scalp biopsy have reported that distinct microbial population extend into middle and lower part of the hair follicles in deep dermal layer in hair loss disorders, such as alopecia areata, androgenetic alopecia, and primary cicatricial alopecia. These results suggest the relationship between dysbiosis and hair loss disorders, although whether the dysbiosis is a primary driver of hair pathology or a secondary consequence of the inflammatory conditions of the scalp hair follicle still remains unclear.

In the presentation, current understanding of the human scalp/hair follicle microbiome and its potential physiological and pathological role in various scalp/hair loss disorders will be reviewed. In addition, the limitations and future direction of scalp microbiome studies will be discussed.

Session 2. AmorePacific symposium (scalp microbiome)

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Yonghee Lee
SCALP BIO LAB, AMOREPACIFIC R&D Center

Education and Training

2009 - 2011 M.S. in Dept. of Life science, Yonsei University, Seoul, Korea

Current and Past Professional Positions

2021 - Current SCALP BIO LAB
2019 - Current Bioscience Lab.
2017 - 2019 Future Tech Lab.
2015 - 2017 Scalp & Hair Research TF
2012 - 2014 Researcher, Department of Dermatology, Chung Ang University College of Medicine, Seoul, Korea

Society Memberships

Korean Dermatological Association
Korean Hair Research Society

Featured Publications

1) Circulating and PBMC Lp-PLA2 associate differently with oxidative stress and subclinical inflammation in nonobese women (menopausal status). PLoS One. 2012;7(2):e29675
2) A combination trial of intradermal radiofrequency and hyaluronic acid filler for the treatment of nasolabial fold wrinkles: a pilot study. J Cosmet Laser Ther. 2014;16(1):37-42
3) Effects of Collagen Tripeptide Supplement on Skin Properties: A prospective, randomized, controlled study. J Cosmetic & laser ther. 2014;16(3):132-137
4) The effect of high advanced-collagen tripeptide on wound healing and skin recovery after fractional photothermolysis treatment. Clin Exp Dermatol. 2014 Dec;39(8):874-80
5) Efficacy and safety of topical glycopyrrolate in patients with facial hyperhidrosis: a randomized multi-center, double-blinded, placebo-controlled, split-face study. J Eur Acad Dermatol Venereol. 2015 Feb;29(2):278-82
6) Mixtures of recombinant growth factors inhibit the production pro-inflammatory mediators and cytokines in LPS-stimulated RAW 264.7 cells by inactivating the ERK and NF-κB pathways. Int J Mol Med. Int J Mol Med. 2014 Aug;34(2):624-31
7) Efficacy and Safety of Injection with Poly-L-Lacitc acid (PLA) as Compared to Hyaluronic acid (HA) in Correction of Nasolabial fold: A Randomized, Evaluator-blinded, Comparative study. Clin Exp Dermatol. 2015 Mar;40(2):129-35
8) Picrasma Quassioides inhibits LPS and IFN-γ-stimulated nitric oxide production and inflammatory response in RAW264.7 macrophage cells. Biotechnology and Bioprocess Engineering 19(3):404-410 · June 2014
9) Berberine regulate melanin synthesis by activating PI3K/AKT, ERK, and GSK3βin B16F10 Melanoma cells. Int J Mol Med. 2015 Apr;35(4):1011-6.
10) Mycophenolate Antagonizes IFN-γ-Induced Catagen-Like Changes via β-Catenin activation in Human Dermal Papilla Cells and Hair Follicles. Int. J. Mol. Sci. 2014, 15, 16800-16815
11) Panax ginseng extract antagonizes the effect of DKK 1-induced catagen-like changes of hair follicles. Int J Mol Med. 2017 Oct;40(4):1194-1200.
12) Anti-apoptotic effects of glycosaminoglycans via inhibition of ERK/AP 1 signaling in TNF α stimulated human dermal fibroblasts. Int J Mol Med. 2018 May;41(5):3090-3098

Major Interests

Hair and skin biology, scalp, microbiome, cosmetics ingredients

Development of novel cosmetic active for healthy scalp based on clinical microbiota analysis

Yonghee Lee, Kilsun Myoung, Taehun Park, Hyun Gee Lee, Paulo André Nóbrega Marinho, Hyoung-June Kim, Seung-Hyun Shin*, Won-Seok Park*

SCALP BIO LAB, AMOREPACIFIC R&D Center

Microorganisms of scalp compose to bacteria and fungi that influence both health and diseased scalp. Scalp microorganisms have essential roles in the protection against invading pathogens, the education of our immune system and the breakdown of natural products. However, changes of balance in the scalp microorganisms have consistently been associated with scalp diseases. In particular, Stahylococcus, Cutibacterium and Malassezia, a common scalp commensal microorganism, are widely known as the cause of most scalp diseases including dandruff and seborrhoeic dermatitis (D/SD).

In this report, we investigate the relationship between scalp microbiota and dandruff/seborrhoeic dermatitis (D/SD), an unpleasant scalp disorder common in human populations. We found scalp microbiome composition significantly differed between the normal and disease groups, and especially we found that co-occurrence network of dominant members was breakdown in disease groups. It was observed that Staphylococcus sp. and M. restricta were associated with a higher incidence of scalp disease.

We also investigated the regulation of scalp microbiota of Amorepacific patented ingredients, which are Lactobacillus ferment lysate (using Lactobacillus plantarum APsulloc 331261, KCCM 11179P). In addition, we investigated the anti-inflammatory, and anti-lipogenic effects of its, focusing on the M.restricta-triggered inflammation and lipogenesis. Lactobacillus ferment lysate significantly inhibited the growth of S. aureus, a scalp harmful microorganism. Moreover, it exerted anti-inflammatory effects by MAPKs signaling in M.restricta-stimulated Scalp-Keratinocyte and human sebocyte. Notably, Lactobacillus ferment lysate regulated lipid biosynthesis via regulating AKT and mTOR signaling in M.restricta-induced lipogenesis of human sebocyte.

These findings will provide novel insights into shifts of microbial community relevant to D/SD, and fermented lysate using Lactobacillus plantarum APsulloc 331261 may be useful as a cosmetic ingredient that can control the balance and environment of scalp microbiome.

Luncheon symposium

Proven long-term safety of finasteride over 20years; Unraveling truth from myth

13:10 - 14:10

Do-Young Kim, Yonsei University

The Korean Hair Research Society

Luncheon symposium

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Do-Young Kim, M.D.,Ph.D.

Associate Professor
Department of Dermatology and Cutaneous Biology Research Institute,
Yonsei University College of Medicine, Seoul, Republic of Korea

Education

1997-2003	B.S. at Yonsei University College of Medicine, Seoul, Korea
2005-2007	M.S. at Yonsei University, Seoul, Korea (Dermatology)
2011-2017	Ph.D. at Yonsei University, Seoul, Korea (Dermatology)

Current and Past Professional Positions

2011-2014	Instructor / Clinical Assistant Professor, Department of Dermatology, Yonsei University College of Medicine, Seoul, Korea
2014-2019	Assistant Professor, Department of Dermatology, Yonsei University College of Medicine, Seoul, Korea
2017-2019	Guest Researcher, Dermatology Branch (Keisuke Nagao Lab), NIAMS, National Institutes of Health, Bethesda, MD, USA
2019-present	Associate Professor, Department of Dermatology, Yonsei University College of Medicine, Seoul, Korea

Major Clinical Interests

Hair disorders, Behçet's disease, Drug adverse events

Proven long-term safety of finasteride over 20 years; Unraveling truth from myth

Do-Young Kim
Dept. of Dermatology, Yonsei University College of Medicine

Current clinical guidelines strongly recommend topical minoxidil and the first systemic 5-alpha reductase inhibitors (5ARi), finasteride, in the treatment of male androgenetic alopecia (AGA)[1,2].
Long-term studies including domestic data on oral 5ARi reiterate the usefulness and safety of finasteride in the management of male AGA[3,4]. Furthermore, observations on clinical outcome in patients aged > 50 years suggests finasteride is still safe and effective choice for the treatment of AGA in aged persons[5].

However, there are still drug-related safety issues in which some patients might raise their concern up to unscientific level of questioning. Such excessive controversy can eventually lead to poor compliance in clinics where therapeutic options are limited.
In this talk, we will briefly review the updated clinical data on efficacy and safety of finasteride, and dissect pitfalls in ongoing concerns on finasteride[6]. A balanced scientific exploration on published data may help unraveling scientific truth from superstitious concerns.

Selected literatures related to the abstract

1. Manabe, M. et al. Guidelines for the diagnosis and treatment of male-pattern and female-pattern hair loss, 2017 version. J Deramatol 45, 1031-1043, doi:10.1111/1346-8138.14470 (2018).
2. Kanti, V. et al. Evidence-based (S3) guideline for the treatment of androgenetic alopecia in women and in men - short version. JEADV 32, 11-22, doi:10.1111/jdv.14624 (2018).
3. Shin, J. W. et al. Evaluation of long-term efficacy of finasteride in Korean men with androgenetic alopecia using the basic and specific classification system. J Deramatol 46, 139-143, doi:10.1111/1346-8138.14719 (2019).
4. Yanagisawa M, et al. Long-term (10-year) efficacy of finasteride in 523 Japanese men with androgenetic alopecia. Clinical Research and Trials 5, 1-5, doi: 10.15761/CRT.1000273 (2019)
5. Kang MJ, et al. 5a-reductase inhibitors in men aged 50 years or older with androgenetic alopecia: A retrospective study. J Am Acad Dermatol 84, 172-173. (2021).
6. Roger H. Ongoing Concerns Regarding Finasteride for the Treatment of Male-Pattern Androgenetic Alopecia. JAMA Dermatol 157, 25-26 (2021).

Session 3.

Hair stem cells

14:10 - 15:40

Chair **Young Kwan Sung,** Kyungpook National University
Chair **Ohsang Kwon,** Seoul National University

The Korean Hair Research Society

Session 3. Hair stem cells

hironobu.fujiwara@riken.jp

Hironobu Fujiwara

RIKEN Center for Biosystems Dynamics Research (BDR)

Short biography:

2019–	JST CREST Investigator
2018–	Team Leader, RIKEN Center for Biosystems Dynamics Research (BDR)
2012–2018	Team Leader, RIKEN Center for Developmental Biology (CDB)
2007–2012	Post-doc, Cancer Research UK Cambridge Research Institute (Fiona Watt laboratory)
2006–2007	Post-doc, Institute for Protein Research, Osaka University (Kiyotoshi Sekiguchi laboratory)
2003–2006	Post-doc, JST ERATO Sekiguchi Project
2003	Ph.D., Osaka University Graduate School of Science
2001–2003	JSPS Research Fellow (DC2), Osaka University
2000	Master, Osaka University Graduate School of Science
1998	Bachelor, Kyoto Pharmaceutical University

Specialty and present interests:

skin development and regeneration, cellular microenvironment, stem cell, live imaging

References (representative papers)

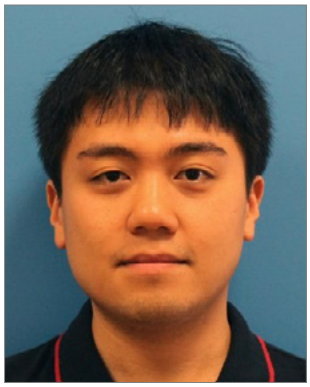
1. Tsutsui K, Machida H, Nakagawa A, Ahn K, Morita R, Sekiguchi K, Miner JH, Fujiwara H (2021) Mapping the molecular and structural specialization of the skin basement membrane for inter-tissue interactions. *Nature Communications*, in press
2. Cheng CC, Tsutsui K, Taguchi T, Sanzen N, Nakagawa A, Kakiguchi K, Yonemura S, Tanegashima C, Keeley SD, Kiyonari H, Furuta Y, Tomono Y, Watt FM, Fujiwara H (2018). Hair follicle epidermal stem cells define a niche for tactile sensation. *eLife*. 7, e38883
3. Fujiwara H, Tsutsui K, Morita R (2018). Multi-tasking epidermal stem cells: Beyond epidermal maintenance. D*evelopment, Growth & Differentiation*, 60: 531-541
4. Donati G, Proserpio V, Lichtenberger BM, Natsuga K, Sinclair R, Fujiwara H*, Watt FM* (*joint-corresponding authors) (2014). Epidermal Wnt/ -catenin signaling regulates adipocyte differentiation via secretion of adipogenic factors. *Proc Natl Acad Sci U S A*. 111 (15): E1501-1509
5. Fujiwara H, Ferreira M, Donati G, Marciano DK, Linton JM, Sato Y, Hartner A, Sekiguchi K, Reichardt LF, Watt FM. (2011). The basement membrane of hair follicle stem cells is a muscle cell niche. *Cell*. 144(4): 577-589.

Origin and induction process of hair follicle stem cells

Hironobu Fujiwara
RIKEN Center for Biosystems Dynamics Research (BDR), Kobe, Japan

Tissue stem cells (SCs) are generated from an embryonic progenitor population through organ-specific morphogenetic events. Although tissue SCs are central to organ homeostasis and regeneration, it remains unclear how they are induced during development, mainly owing to the lack of specific markers that exclusively label prospective SCs. Here, by combining marker-independent long-term three-dimensional (3D) live imaging and single-cell transcriptomics, we captured cellular dynamics, cell lineages, and transcriptome changes in the entire epithelium of developing mouse hair follicles (HFs). We found that different epithelial lineage precursors were aligned in a two-dimensional (2D) concentric manner in the basal layer of the hair placode. Each concentric ring zone acquired unique transcriptomes and telescoped out to form longitudinally aligned 3D cylindrical compartments. Prospective bulge SCs were derived from the peripheral ring zone of the placode, irrespective of cell division orientation, but not from previously suggested suprabasal cells. We also identified 13 gene clusters in which their ensemble expression dynamics drew the entire transcriptional landscape of epithelial lineage diversification, coinciding with cell lineage data. Combining these findings with insect appendage development, we provide a generalized model termed the “telescope model” wherein 2D concentric zones in the placode telescope out to form 3D longitudinally aligned cylindrical compartments.

Session 3. Hair stem cells



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Hanseul Yang
Department of Biological Sciences, KAIST

Education and Training

2004-2008 KAIST, Undergraduate
2008-2010 KAIST, MS
2010-2013 KAIST, Researcher
2013-2018 Rockefeller University, PhD
2018-2020 Rockefeller University, Postdoc

Current and Past Professional Positions

2020-현재 KAIST, Assistant Professor

Awards

2021 POSCO TJ Park Junior Faculty Fellowship
2018 Keystone Symposia Future of Science Fund Scholarship
2017 ASCB Annual Meeting Travel Award
2016 AACR-Aflac, Inc. Scholar-in-Training Award

Society Memberships

Korean Hair Research Society
The Korean Society for Investigative Dermatology (KSID)
Korea Society for Stem Cell Research

Featured Publications

1. Yang H, Adam RC, Ge Y, Hua ZL, Fuchs E. Epithelial-mesenchymal micro-niches govern stem cell lineage choices. *Cell* 2017;169(3), 483-496
2. Adam RC*, Yang H*, Ge Y, Lien WH, Wang P, Zhao Y, Polak L, Levorse J, Baksh SC, Zheng D, Fuchs E. Temporal Layering of Signaling Effectors Drives Chromatin Remodeling during Hair Follicle Stem Cell Lineage Progression. *Cell Stem Cell*, 2018;22(3), 398-413 (*Co-first authors)
3. Adam RC*, Yang H*, Ge Y, Infarinato NR, Gur-Cohen S, Miao Y, Wang P, Zhao Y, Lu CP, Kim JE, Ko JY, Paik SS, Gronostajski RM, Kim J, Krueger JG, Zheng D, Fuchs E. NFI transcription factors provide chromatin access to maintain stem cell identity while preventing unintended lineage fate choices. *Nature Cell Biology*, 2020;22(6), 640-650. (*Co-first authors)
4. Yang H*, Schramek D*, Adam RC, Keyes BE, Wang P, Zheng D, Fuchs E. ETS family transcriptional regulators drive chromatin dynamics and malignancy in squamous cell carcinomas. *eLIFE* 2015;4, e10870 (*Co-first authors)

Major Interests

Adult stem cell, Tissue regeneration, Epigenetics, Single cell genomics

How stem cells juggle lineage choice: Epigenetic mechanisms of tissue regeneration of adult hair follicle stem cell

Hanseul Yang
Department of Biological Sciences, KAIST, Daejeon, Korea

Tissue regeneration relies on resident stem cells, whose activity and lineage choices are influenced by microenvironment. Once activated, stem cells typically give rise to short-lived progenitors, which then progress to differentiate into their lineages. Exploiting the synchronized cyclical bouts of tissue regeneration in hair follicles, we investigated when and how stem cell lineage choices take place. Using temporal single-cell RNA-seq, we unearthed unexpected heterogeneity among stem cells and their progeny and found that the ability of stem cells to make lineage choices (plasticity) becomes restricted in a sequentially and spatially choreographed program. We traced the roots of lineage restriction to micro-niches located along epithelial-mesenchymal borders, each of which receive slightly different signaling inputs. Whether these signals are WNTs, BMPs or NOTCH, each has its own effector that alters the activity of a downstream transcription factor. Employing epigenetic and ChIP-seq profiling, we uncover how signal-dependent transcription factors couple spatio-temporal cues to chromatin dynamics. In summary, our studies using a hair follicle regeneration model system show how stem cells establish chromatin platforms permissive for diversification and how new signaling inputs progressively compartmentalize lineage options in vivo by modifying chromatin dynamics.

Session 3. Hair stem cells

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Jong-Hyuk Sung
Yonsei University, Incheon, Korea
Epibiotech Co. Ltd., Incheon, Korea

Education and Training

1994-2005 College of Pharmacy, Seoul National University (BS, MS, Ph.D.)
2006-2007 Yale University School of Medicine (postdoc)

Current and Past Professional Positions

2007-2009 Prostemics, Director
2009-2013 Cha University
2004-present Yonsei University (College of Pharmacy)
2005-present Epibiotech Co. Ltd, CEO

Awards

2019 Minister of Small and Medium Venture Business Award

Society Memberships

The Pharmaceutical Society of Korea

Featured Publications

Zheng M, Choi N, Jang Y, Kwak DE, Kim Y, Kim WS, Oh SH, Sung JH, Hair growth promotion by necrostatin-1s, Sci Rep. 2020 Oct 19;10(1):17622
Ku KE, Choi N, Sung JH, Inhibition of Rab27a and Rab27b Has Opposite Effects on the Regulation of Hair Cycle and Hair Growth, Int J Mol Sci. 2020 Aug 7;21(16):5672
Choi N, Kim WS, Oh SH, Sung JH, Epiregulin promotes hair growth via EGFR-medicated epidermal and ErbB4-mediated dermal stimulation, Cell Prolif. 2020 Sep;53(9):e12881
Zheng M, Jang YJ, Choi N, Kim DY, Han TW, Yeo JH, Lee J, Sung JH. Hypoxia Improves Hair Inductivity of Dermal Papilla Cells via Nuclear NADPH Oxidase 4-Mediated Reactive Oxygen Species Generation. Br J Dermatol. 2019 Sep;181(3):523-534
Choi N, Choi J, Kim JH, Jang Y, Yeo JH, Kang J, Song SY, Lee J, Sung JH. Generation of trichogenic adipose-derived stem cells by expression of three factors. J Dermatol Sci. 2018 Oct;92(1):18-29

Major Interests

Stem cells, Hair regeneration, Dermal papilla cell, Antibody

Cell therapy using dermal papilla cells

Jong-Hyuk Sung[1,2]
[1]Yonsei University, Incheon, Korea, [2]Epibiotech Co. Ltd., Incheon, Korea

Dermal papilla cells, which regulate signals important for hair regeneration at the root of the hair, have recently been in the spotlight as a treatment for hair regeneration. If the dermal papilla cells are separated, cultured, and transplanted, the hair can be regenerated, but the hair regeneration ability decreases in the process of culturing a very small amount of dermal papilla cells. In this presentation, I would like to introduce the recent technologies necessary to establish a cultivation method for dermal papilla cells that have secured efficacy and safety in order to develop dermal papilla cells as a cell therapy. Hypoxia, ROS donors, etc. were pretreated in the culture process to enhance hair growth function, and the regeneration effect was increased by increasing the expression of collagens through 3D culture. In addition, I will introduce methods for preparing the hair cells and hair organoids from adipose-derived stem cells and iPS cells.

Session 3. Hair stem cells

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Ji Won Oh

Assistant Professor
Department of Anatomy, School of Medicine, Kyungpook National University
Assistant Professor
Hair Transplantation Center, Kyungpook National University Hospital

Education and Training

2001.03 - 2007.02 M.D.
School of Medicine, Kyungpook National University, Daegu, Korea
2007.03 - 2008.08 M.S. in Medicine (Immunology)
School of Medicine, Kyungpook National University, Daegu, Korea
2008.09 - 2013.08 Ph.D. in Biomedical Science (Applied Medical Science)
School of Medicine, Kyungpook National University, Daegu, Korea
2013.10 - 2016.02 Post-doctoral Researcher, Supervisor: Prof. Maksim Plikus (Ph.D.)
University of California, Irvine. CA

Current and Past Professional Positions

2007.03 - 2009.06 Researcher
The Advanced Medical Technology Cluster for Diagnosis and Prediction
2007.03 - 2008.10 Fellowship and Training (as Hair Transplantation Surgeon)
Hair Transplantation Center in Kyungpook National University Hospital
2008.10 - 2010.09 Instructor
Center for Laboratory Animal Resources, Kyungpook National University
2007.03 - 2012.06 Teaching Assistant
in Immunology, Genetics and Medical Experiment
Department of Immunology, School of Medicine, Kyungpook National University
2017.09 - 2020.08 Chief Technology Officer
Binaree Inc.

Awards

2011.07 15th European Hair Research Society Travel Grant from Korean Hair Research Society
2013.05 MEDIPOST Best Article Award from Korean Tissue Engineering and Regenerative Medicine Society
2016.12 Jeong-Moo Academic Award from 甲乙 international group
2020.09 Korea Innovative Company Award from The Hankook Ilbo

Society Memberships

Korean Society of Hair Restoration Surgery (KSHRS)
Korea Brain Research Institute (KBRI)
The Korean Hair Research Society (KHRS)

Major Interests

Anatomy, Post-mortem research, Lineage tracing, Stem cell

The domain specific murine skin pattern and hair cycle evolution

Ji Won Oh[1,2]

[1]*Department of Anatomy, School of Medicine, Kyungpook National University, Daegu, Korea.*
[2]*Hair Transplantation Center, Kyungpook National University Hospital, Daegu, Korea.*

Recognized for periodicity and excitability, the hair follicle (HF) is a popular system for studying regeneration. We present the realistic HF morphology, and where hair-to-hair growth coordination emerges based on shared signaling. We scrutinized the morphological dynamics of skin patterns by examining whole murine skin on HF growth and regression phase. We revealed that skin behaves as a heterogeneous excitable medium, composed of anatomic domains with distinct cycling dynamics and novel hair growth behaviors. Interactions between fast-cycling ventral and slow-cycling dorsal HF populations produce deterministic ventral-to-dorsal hair growth waves and bilaterally symmetric patterns in young mice. Ear skin behaves as a hyper-refractory domain with HFs that physiologically equilibrate in an extended telogen, do not propagate hair growth waves, and respond poorly to growth-inducing stimuli. Such hyper-refractivity relates to high levels of BMP ligands, in part secreted by auricular cartilage and muscle, tissues specific to the ear pinna. Additionally, homogenous hair waves can break at the boundaries with hyper-refractory ears and anatomically discontinuous eyelids, generating diffraction-like hair growth patterns. We posit those similar mechanisms for coupled regeneration with oscillator, hyper-refractory, and wave-breaker regions can operate in other actively renewing tissues and organs.

Session 4.

Patterned hair loss

16:00 - 17:30

Chair Kyu Han Kim, Seoul National University
Chair Dong-Youn Lee, Sungkyunkwan University

The Korean Hair Research Society

Session 4. Patterned hair loss

Rodney.sinclair@sinclairdermatology.com.au

RODNEY DANIEL SINCLAIR M.B.B.S., M.D., F.A.C.D.
Sinclair Dermatology, Australia

Qualifications

Bachelor of Medicine, Bachelor of Surgery (Melb), 1987
Fellow of the Australasian College of Dermatologists, 1995
Doctor of Medicine (Melb), 2004

Present Appointments

Professorial Fellow, University of Melbourne
Executive Director, Sinclair Dermatology

Publications

	Published (Medline)
Primary Manuscripts and reviews	307
Case Reports	62
Published Abstracts	128
Correspondence	22
Articles for the Conversation	25
Articles for Victorian Government Better Health Channel	37
Group Studies	1
Non-Peer Review Journals	58
Books	14
Book Chapters	70

Key Textbooks/Book Chapters

1. Ryan TJ, Sinclair RD. Section 23. Diseases of the Skin. In Warrell DA, Cox TM, Firth JD, Benz EJ. Oxford Textbook of Medicine, Fourth Edition. Oxford University Press. Oxford 2003.Vol 3, pp 804-902.
2. Sinclair R, Banfield C, Dawber R. Handbook of diseases of the hair and scalp. Blackwell Science, Oxford 1999.
3. Sinclair R, Banfield C, Dawber R. Manuale delle malattie del sistema pilifero e del cuoio capelluto. Blackwell Science, Oxford 2002.
4. Price CJ, Sinclair R. Fact Facts; Minor Surgery. Heatlh Press. 2nd Edition, Oxford, 2008
5. Sperling L, El Shabrawi Caelen L, Sinclair R. Alopecias. In Bologna. Ed Dermatology. 2012
6. Messenger A, De Berker D, Sinclair R. Acquired Disorders of Hair. In: Griffiths, Barker, Bleiker, Chalmers, Creamer (Eds.). Rook's Textbook of Dermatology. Ninth Edition. Blackwell Publishing. Oxford. 2016.
7. Farrant P, Sinclair R. Dermatoses of the Scalp. In: Griffiths, Barker, Bleiker, Chalmers, Creamer (Eds.). Rook's Textbook of Dermatology. Ninth Edition. Blackwell Publishing. Oxford. 2016
8. Cranwell W, Sinclair R. Male Androgenetic Alopecia. In: In: De Groot LJ, Beck-Peccoz P, Chrousos G, Dungan K, Grossman A, Hershman JM, Koch C, McLachlan R, New M, Rebar R, Singer F, Vinik A, Weickert MO, editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2016-.
9. Therapeutic guidelines: Dermatology. Version 1. Therapeutic guidelines Limited. Melbourne 1999. (Multi-authored booklet).

Minoxidil. Mechanism of action and utility in the treatment of pattern hair loss

Rodney Sinclair
Sinclair Dermatology, Australia

Minoxidil is a piperidine-pyrimidine derivative and a potent vasodilator approved orally for severe hypertension and topically for androgenetic alopecia (AGA). The minimum plasma threshold for induction of hair growth is an order of magnitude below the threshold required for any haemodynamic effect.

With respect to its hemodynamic effects, oral minoxidil (OM) is a pro-drug converted by hepatic dehydroepiandosterone sulfotransferase (SULT2A1) into minoxidil sulfate Heterogeneity in the efficiency of SULT2A1 activity influences its antihypertensive efficacy. The plasma concentration threshold of minoxidil for any hemodynamic response is 18 ng/ml.

With respect to hair growth, minoxidil lotion (ML) is also a pro-drug converted by follicular thermostable phenol sulfotransferase (SULT1A1) into minoxidil sulfate. There is considerable inter-subject variability in follicular SULT1A1 and low SULT1A1 predicts a weak response to ML. There is no known correlation between SULTs1A1 and 2A1 activity.

Minoxidil is poorly soluble. The maximum concentration stable in solution is 5% (50mg/ml). Percutaneous absorption ranges between 1.5-4%. Mean C_{MAX} after twice daily application of 2% minoxidil lotion (20mg/ml) is 0.7 ng/ml and 1.8ng/ml with 5% minoxidil (50mg/ml). Application frequency higher than twice daily does not further increase absorption as the initial dose saturates the skin for a period of time longer than the dosing interval.

Approximately 50% of the population have low SULT1A1 activity and overall approximately 50% patients treated with ML fail to achieve hair regrowth. Increasing the concentration of minoxidil lotion or the frequency of application does not increase regrowth due its low solubility, poor percutaneous absorption and saturation absorption kinetics. Maximal ML therapy may be sub-therapeutic in patients with low SULT1A1 and ML non-responders generally require systemic administration of minoxidil for hair growth.

OM produces dose-dependent hair growth even in patients with low SULT1A1 activity. OM undergoes first-pass hepatic metabolism to minoxidil sulfate by SULT 2A1, simultaneously increasing the risk of haemodynamic side effects and reducing hair follicle bioavailability of minoxidil. Therefore we became interested in sublingual minoxidil (SM) as an alternative to OM. Sublingual dosing bypasses hepatic first pass metabolism and therefore might be expected to increase the follicular minoxidil sulfate bioavailability and consequently hair growth

The mechanism of action of minoxidil with respect to hair growth remains obscure. Minoxidil sulphate is thought to enhance scalp perfusion through activation of endothelial potassium channels to induce vasodilatation and to upregulate vascular endothelial growth factor (VEGF) thereby helping to maintain dermal papilla vasculature and promote hair growth. We propose an alternate hypothesis whereby minoxidil sulfate directly activates the ASCT-1 neutral amino acid transporter in the hair follicle ORS to promote uptake of cysteine into the keratogenous zone of the follicle.

Session 4. Patterned hair loss

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Young Lee

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Education and Training

2005.2 M.S. in Dermatology, Chungnam National University, Daejeon, Korea
2008.2 Ph.D in Dermatology, Chungnam National University, Daejeon, Korea

Current and Past Professional Positions

2011.3-2014.8 Assistant Professor, Department of Dermatology, Chungnam National University, Korea
2014.9-2018.8 Associate Professor, Department of Dermatology, Chungnam National University, Korea
2019.8-2020.8 Visiting Scholar, Department of Dermatology, Rutgers, New Jersey Medical School
2018.9-present Professor, Department of Dermatology, Chungnam National University, Korea

Awards

2015 Research award (Daejeon Medical R&D Forum)
2017 Uam award (The Korean Society for Investigative Dermatology)
2017 27th Korean Federation of Science and Technology Societies (KOFST) award

Society Memberships

Member of the Korean Hair Research Society
Member of Korean Society for Investigative Dermatology
Member of Korean Society of Dermatology

Featured Publications

Putative therapeutic mechanisms of simvastatin in the treatment of alopecia areata. J Am Acad Dermatol. 2021;84:782-784
Exome sequencing reveals novel candidate gene variants associated with clinical characteristics in alopecia areata patients. J Dermatol Sci. 2020;99:216-220
Clinical relevance for serum cold-inducible RNA-binding protein level in alopecia areata. Ann Dermatol. 2019;31:387-392
Induction of alopecia areata in C3H/HeJ mice using polyinosinic-polycytidylic acid (poly[I:C]) and interferon-gamma. Sci Rep. 2018;8:12518
Double-stranded RNA induces inflammation via the NF-κB pathway and inflammasome activation in the outer root sheath cells of hair follicles. Sci Rep. 2017;7:44127

Major Interests

Alopecia areata, androgenetic alopecia, female pattern hair loss, vitiligo

Complementary and alternative treatments for androgenetic alopecia

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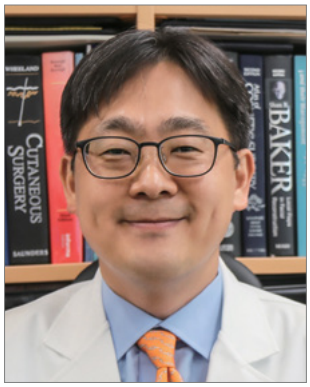
Androgenetic alopecia (AGA) is characterized by non-scarring progressive miniaturization of the hair follicle in predisposed men and women with a pattern distribution. Currently, male pattern hair loss is known to be mediated by dihydrotestosterone; however, the pathophysiology of female pattern hair loss is not yet completely understood. There is evidence that genetic, hormonal, and possibly environmental factors are involved in female pattern hair loss.

Although AGA is a very prevalent condition (about 80% of Caucasian men and 40-50% of Caucasian women are affected), the approved therapeutic options are limited. So far, topical minoxidil, finasteride, and low-level laser light therapy are FDA-approved/cleared treatments for AGA with the highest level of evidence. For female patients, the role of antiandrogens and the importance of co-adjuvant therapies are still uncertain.

Some minimally invasive techniques, mesotherapy, micro-needling, carboxytherapy, and platelet-rich plasma are also used to stimulate hair growth. Furthermore, pharmaceutical substances with mechanisms that differ from antiandrogen activity, such as prostaglandin analogs and antagonists, botulinum toxin, oral minoxidil, and stem cell treatment modalities are under progress.

Recent studies revealed new perspectives by exploring the topical use of JAK-STAT inhibitors promoting anagen hair growth in normal mice and hair follicle growth in humans. Moreover, there are trials for developing herbal drugs to minimize side effects and potentiate their activity by introducing a new drug delivery system and several trials show that drugs can act by activating Wnt/beta-catenin signaling for initiating and maintaining anagen phase.

Session 4. Patterned hair loss



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Chang Hun Huh

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Education and Training

2004-2007	Seoul National University College of Medicine (PhD), Seoul, Korea
1989-1995	Seoul National University College of Medicine (MD), Seoul, Korea
2003-2004	Dermatology fellow, Seoul National University Hospital, Seoul, Korea
1999-2003	Dermatology residency, Seoul National University Hospital, Seoul, Korea

Current and Past Professional Positions

2017-present	Professor, Dermatology, Seoul National University Bundang Hospital
2012-2017	Associate professor, Dermatology, Seoul National University Bundang Hospital
2004-2012	Assistant professor, Dermatology, Seoul National University Bundang Hospital

Awards

2017.10.	PRS Global Open “Best International Collaboration Paper-Gold”
2011.08.	International Preceptorship Recipient by American Society for Dermatologic Surgery (ASDS)
2008.05.	International Investigative Dermatology (IID) 2008 Travel Grant awarded by Japan Society for Investigative Dermatology (JSID)
2006.10.	Imrich Sarkany Non-European Exceptional Cases Grant awarded by the European Academy of Dermatology and Venereology.(15th EADV Meeting)
2004.02.	American Academy of Dermatology (AAD) 2004 Travel Grant awarded by AAD

Society Memberships

Korean Hair Research Society
Korean Society for Dermatologic Surgery
Korean Society for Dermatologic Laser Surgery
Korean Society of Cosmetic Dermatology
Korean Society for Laser Medicine and Surgery

Featured Publications

“Chapter 31. Robotic Follicular Unit Extraction” and “Chapter 68. Current and Future Medical Treatment of Androgenetic Alopecia” on “Practical Aspect of Hair Transplantation in Asians” by Spinger Japan, 2018.
“Chapter 3. Potential Adverse Effects after Procedures in Ethnic Skin” on “Cosmetic Dermatology in Skin of Color” by Mc Graw-Hill. 2008
Korean Book : Dermoscopy for Asian
Korean Book : Color Atlas of Cutaneous Excision and Repairs
Korean Book : Cosmetic management success strategies

Major Interests

Hair & Scalp Disease, Alopecia, Stem Cell Biology, Dermatologic Surgery, Bio-engineering, Medical device

What's new in hair transplantation?

Chang Hun Huh
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Hair transplantation has been a great effective treatment option for the hair loss especially AGA patients since several decades. As increased technological development and scientific findings, operation skills also have been changed and new techniques also introduced.
Traditionally, strip surgery for donor area and implanters for recipient area were major skill of Korean (even in Asian) surgeons. But FUE surgery has been increased gradually and it took a majority of donor harvesting technique.
Robot has been developed for aiding FUE harvesting, and finally it can do the implantation.
In this lecture, I will introduce and share the ideas about the trends of surgery and new technologies involved in hair replacement treatment.

Session 4. Patterned hair loss

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Ajou University School of Medicine

EDUCATION

2007	M.D., Seoul National University College of Medicine, Seoul, Korea
2007 - 2008	Internship, Samsung Medical Center, Seoul, Korea
2008 - 2012	Resident, Department of Dermatology, Seoul National University Hospital, Seoul, Korea
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2018	Ph.D., Seoul National University Graduate School of Medicine, Seoul, Korea

POSITIONS HELD SINCE GRADUATION

2012 - 2015	Public Health Doctor, Danyang Public Health Care Center, Danyang, Korea
2015 - 2017	Clinical Fellow, Seoul National University Bundang Hospital, Seongnam, Korea
2017 - 2020	Clinical Assistant Professor, Department of Dermatology, Ajou University Medical Center
2020 - present	Assistant Professor, Department of Dermatology Ajou University School of Medicine

MEDICAL SOCIETY MEMBERSHIP

The Korean Dermatological Association
The Korean Hair Research Society
The Korean Society of Skin Cancer
The Korean Society for Aesthetic and Dermatologic Surgery

AWARDS

2010	Travel Grant, Korean Hair Research Society
2017	Travel Grant, Korean Hair Research Society
2018	Research Grant, Korean Hair Research Society
2020	Amore Pacific Scholarship

Comorbidities in patients with androgenic alopecia ; It's a bit more complicated than you think

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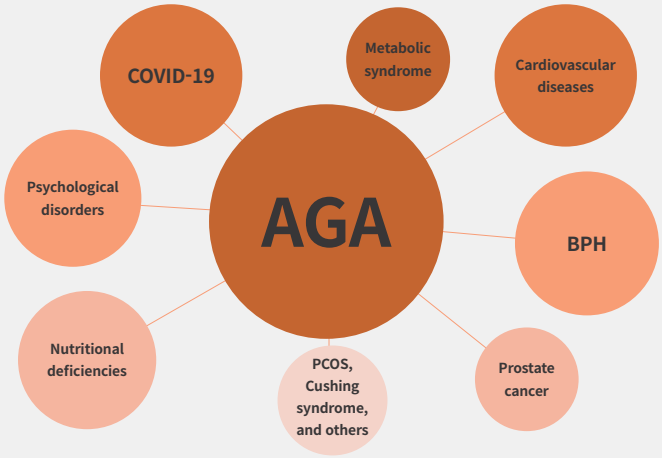
Hair loss is a common condition that affects most people at some point in their lives. It can exist as an isolated problem or with other diseases and conditions. Among all hair loss disorders, androgenetic alopecia (AGA) is the most common form of baldness which primarily affects the top and front of the scalp. AGA and its association with other comorbidities including the metabolic syndrome and cardiovascular disease have received increasing interest since 1972. Many studies have investigated the relationship among AGA and its comorbidities, where a disproportionately large number of these studies supports this association. The male hormones (androgen) including testosterone and dihydrotestosterone might play an important role in the association.
In this presentation, I will talk about the comorbid conditions of AGA and how they are related together.

Why should we know about the comorbidities?

· Hair loss is a topic of enormous public interest!
  · The number of patients seeking care ↑
· AGA as an early sign of other internal problems
  · Early detection
  · Early intervention if needed



Posters

The Korean Hair Research Society

The association between adenotonsillectomy and alopecia areata in childhood: A nationwide population-based retrospective cohort study

Hanjae Lee[1], Soo Ick Cho[1], Da-Ae Yu[1], Dong-Young Kim[2], Ohsang Kwon[1*]

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Recent studies suggest that adenotonsillectomy may disrupt the development of a healthy immune system and lead to an increased long-term risk of autoimmune disorders. However, the association between adenotonsillectomy and skin disorders remains unknown. In the present study, we aimed to determine the risk of autoimmune skin disorders in pediatric patients who received adenotonsillectomy. A nationwide population-based retrospective cohort study was performed using the Korean National Health Insurance claims database. A birth cohort from January 2002 to December 2006 was evaluated up to December 2019. A total of 2,331,360 children were included in the study, and 73,637 subjects were identified as the study population. There was a statistically meaningful association between adenotonsillectomy and alopecia areata (IRR 1.238; 95% CI, 1.104-1.388). This association was also maintained in subgroup analysis regardless of sex or age group at surgery. There was no significant association between the surgery and psoriasis (IRR, 0.934; 95% CI, 0.752-1.160) or vitiligo (IRR, 1.094; 95% CI, 0.939-1.273). The findings from our study revealed an increased risk of alopecia areata in patients who received adenotonsillectomy within the first 9 years of age. Although adenotonsillectomy is essential for certain patients, our results suggest that adenotonsillectomy may inflict a lasting effect on the occurrence of alopecia areata, warranting prudence before making the decision to remove the adenoids and tonsils.

Hair loss accompanied by Drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome: A case series

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Drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome is a severe cutaneous drug reaction characterized by fever, lymphadenopathy, hematologic abnormalities, multisystem involvement, and viral reactivation. Characteristics of patients experiencing hair loss as a symptom of DRESS syndrome or a delayed sequela have been rarely described in previous literatures. We performed a retrospective review of 180 cases diagnosed as DRESS syndrome between January 2010 and March 2021 at our institution and two affiliated hospitals, selecting 10 cases of patients with alopecia that occurred after the onset of DRESS syndrome.

Among 10 patients, there were 4 men and 6 women. The mean age at diagnosis was 40.6 ± 18.2 years. The most common culprit drug was antiepileptics (4 patients by carbamazepine and 1 patient by lamotrigine), followed by sulfonamide (2 patients by dapsone and 1 patient by sulfasalazine), allopurinol, and antibiotics (1 patient, respectively).

The mean durations from initiation of culprit drug to DRESS syndrome onset and from DRESS syndrome onset to alopecia onset were 22.7 ± 7.9 and 69.8 ± 88 days, respectively.

Patients were diagnosed with 4 permanent alopecia, 5 telogen effluvium, and 1 alopecia areata. They were treated with topical minoxidil or alfatradiol (6 patients), topical corticosteroid (3 patients), oral supplement (6 patients), systemic corticosteroid (1 patient), intralesional corticosteroid injection (2 patients).

The most common rash morphology was exfoliative (8 patients) followed by purpura (5 patients), urticarial (3 patients), lichenoid (2 patients), blister (2 patients), and plaque (1 patient).

Alopecia due to DRESS syndrome causes suffer for patients as it shows a long-term course that persists even after the skin symptoms on the body improves. Recognizing that various types of alopecia can occur in DRESS syndrome, appropriate therapeutic intervention should be implemented for each patient.

A pilot study on hair changes and hair loss care in female breast cancer patients receiving adjuvant hormone therapy

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Hormone therapy, which includes tamoxifen and aromatase inhibitors (AI), are among the most common and effective adjuvant therapies for breast cancer. However, only few studies on endocrine therapy-induced alopecia have been reported in literatures.

We investigated the effect of long-term adjuvant hormone therapy on hair in breast cancer patients and to find out their concerns and treatment status on hair loss and/or thinning.

Breast cancer patients were asked to complete a questionnaire which investigated the self-perceived hair changes after each breast cancer adjuvant therapy, presence of distress, and treatment status. Furthermore, hair density and thickness on vertex and occipital area of each patient were measured using a folliscope.

Total of 93 breast cancer patients (mean age of 51.9 ± 9.8 years) were diagnosed with breast cancer at the mean age of 49.1 ± 9.8 years. The folliscope assessment demonstrated the following measurement of the mean hair density and thickness: 106.36±21.85 hairs/cm2, 0.07±0.01 mm at the vertex, 110.77±20.09 hairs/cm2, 0.08±0.09 mm at the occipital. No statistical significance of folliscopic measurement were found between the patients with chemotherapy and hormone therapy, and only hormone therapy, and between tamoxifen and AI. Among 76 patients who perceived change in hair after the adjuvant therapy, 71.1% (n=54) patients felt distress about the hair changes. However, only 7.8% were currently on treatments for hair changes including 2 patients seeing dermatology specialist.

A deeper interest in breast cancer patient's hair changes and research are necessary to change the patient's perception of alopecia treatment through specialists.

Ectodysplasin-A2 induces Dickkopf 1 expression in human balding dermal papilla cells overexpressing the ectodysplasin A2 receptor and causes apoptosis in cultured human hair follicle cells

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Androgenetic alopecia (AGA) is a common genetic disorder, and a X-chromosomal locus that contains the androgen receptor (AR) and ectodysplasin A2 receptor (EDA2R) genes represents a major susceptibility locus for AGA. Ectodysplasin A1 (EDA-A1) and ectodysplasin A2 (EDA-A2) are two isoforms of ectodysplasin and bind two different receptors, ectodysplasin A receptor (EDAR) and EDA2R, respectively. Mutations of EDA-A1 and its receptor EDAR have been associated with hypohidrotic ectodermal dysplasia. However, the role of EDA-A2 and the expression pattern of EDA2R in human hair follicles (HFs) have not been reported. And the role of the EDA-A2/EDA2R in AGA remains unknown, as the causative gene in this pathway has not yet been identified and potential functional connections between EDA-A2 signaling and the androgen pathway remain unclear.

In this study, we investigated the expression of EDA2R in human HFs. EDA2R was strongly expressed in outer root sheath (ORS) cells and weakly expressed in dermal papilla (DP) cells. EDA-A2 induced the apoptosis of both ORS and DP cells via the activation of cleaved caspase-3. Also the EDA2R level was upregulated in the balding DP cells compared with non-balding DP cells. However, EDA2R was strongly expressed in both balding and non-balding ORS cells. We screened EDA-A2-regulated genes in balding DP cells and identified dickkopf 1 (DKK-1) as catagen inducer. The expression levels of DKK-1 were upregulated by EDA-A2. DKK-1 expression was also induced by EDA-A2 both in cultured human HFs and in mouse HFs. Moreover, the EDA-A2-induced apoptosis of DP and ORS cells was reversed by the antibody-mediated neutralization of DKK-1. EDA-A2 induced apoptosis in cultured HF cells and caused the premature onset of the catagen phase.

Our data suggest that EDA-A2 induces DKK-1 secretion and causes apoptosis in HFs by binding EDA2R, which is overexpressed in the bald scalp. EDA-A2/EDA2R signaling could inhibit hair growth through DKK-1 induction, and an inhibitor of EDA-A2/EDA2R signaling may be a promising agent for the treatment and prevention of AGA.

A rare kinky hair disease: Menkes disease

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Menkes disease is a rare X-linked disease, caused by genomic mutation in ATP7A, a copper-binding ATPase, followed by disorder in copper metabolism, especially copper transport. Kinky hair, developmental delay and neurological deterioration are characteristic features and appear within a year after birth.

We aim to share a case showing typical clinical features and laboratory findings of Menkes disease.

A 3-month-old male infant admitted in the department of pediatrics due to hypotonia. He had been born at 37 weeks of gestation, by vaginal delivery. Subdural hematoma and perinatal ventriculomegaly had been previously noted. He had history of convulsions and took anticonvulsants including phenobarbital. He was referred to the department of dermatology for hair and skin evaluation. On clinical examination, he showed loose skin laxity and, on his scalp, short, thin, brittle and kinky hairs were seen. In microscopic examination, shallow hair shaft, pili torti, trichorrhexis nodosa and trichoclasis were dominant. In laboratory analysis, serum copper and ceruloplasmin levels were decreased as 3 ug/dL and < 3.0 mg/dL, respectively. Whole exome sequencing revealed pathogenic variant ATP7A. Treatment began with subcutaneous copper supplement infusion, and anticonvulsants were prescribed for seizure control.

Our case showed typical clinical features and laboratory findings of Menkes disease and genetic analysis suggested it. Herein, we report a rare case showing typical Menkes disease which may worth everyone to know about.

Protective effects of Red Ginseng against oxidative stress induced human hair damage

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[2]Department of Dermatology, Yanbian University Hospital, Yanji, China

Oxidative stress is associated with hair aging and disease in humans. The purpose of this study was to determine the protective effects of red ginseng (RG) against oxidative stress induced human hair damage. We evaluated the effects of RG and its main ginsenosides on hydrogen peroxide (H_2O_2) induced oxidative hair damage with human follicular keratinocytes (FKCs) and hair follicle organ culture model. As results, H_2O_2 increases apoptosis of FKCs and pretreatment of RG suppresses it. Among key ginsenosides of RG, ginsenoside Rb1 (G-Rb1) more effectively prevents H_2O_2 induced apoptosis of FKCs. G-Rb1 prevents H_2O_2 induced ROS generation and activation of ER stress related proteins, and suppresses H_2O_2 induced upregulation of p53/caspase-3/Bax/p21/p27 expression and downregulation of Bcl-2/Cyclin D/ Cyclin E expression. In organ cultured human hair follicles, G-Rb1 prevents H_2O_2 induced hair growth inhibition and premature catagen development. In conclusion, RG and its key components G-Rb1 may protect against H_2O_2 induced oxidative hair damage through the modulation of ROS and p53/capase-3/Bax/Bcl-2 mediated apoptosis.

Association of male androgenetic alopecia with female pattern hair loss and maternal factors

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Department of Dermatology and Institute of Hair and Cosmetic Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea

Androgenetic alopecia (AGA) is a common hair loss disease with a characteristic pattern, which differs between male and female. For classification of AGA, BASP and modified BASP classification has been proposed, and in general, male AGA (MAGA) are characterized by basic type of M, C, and U type and V type as specific type. However, MAGA are often accompanied by female pattern hair loss (FPHL) such as F type, and it is considered a distinct clinical variant of AGA. In addition, the associated factors for MAGA with female pattern hair loss have not yet been clear. To identify these factors, medical records of 411 patients with MAGA were retrospectively assessed. Patients were subdivided into MAGA without FPHL and MAGA with FPHL groups and demographic variables, comorbidities, laboratory variables, and disease-specific variables were compared between the 2 groups. Of the 411 MAGA patients, 274 (65.1%) had FPHL which was a much higher rate than previously reported. Among the variables, only familial history of AGA had significant differences. MAGA with patrilineal history of AGA were at a decreased risk of FPHL (odds ratio [OR], 0.618; 95% confidence interval [CI], 0.513-0.976). In contrast, MAGA with matrilineal history of AGA were at an increased risk of FPHL (OR, 1.857; 95% CI, 1.108-3.111). In particular, if there is a maternal history of AGA, the OR significantly increased to 3.493 (CI, 1.190-10.253). The such impact of maternal history of AGA on MAGA with FPHL is in line with previous studies that emphasized androgen receptor gene is located on X chromosome. In conclusion, MAGA patient with maternal history of AGA is more likely to accompanying FPHL. Therefore, early intervention would be necessary in these patients, and it is important to focus on the frontal area as well as the anterior hairline when applying topical minoxidil.

Negative correlation of serum vitamin D levels and vellus hair counts in androgenetic alopecia

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Androgenetic alopecia (AGA) is a common hair loss disorder characterized by gradual hair follicle miniaturization and consequent increase in vellus hair count. As immunomodulatory factors, vitamin D is known to be involved in the pathogenesis of several autoimmune diseases. Recently, the association between pattern hair loss and vitamin D deficiency has been proposed. To investigate the effect of vitamin D deficiency on AGA, single-center retrospective study was performed. Of the 95 patients, 93 (97.89%) had vitamin D deficiency. The mean 25-hydroxyvitamin D level was 17.59 ng/mL and there was no significant difference between male (17.13 ng/mL) and female (18.46 ng/mL) patients. A significant negative correlation (p=.006) has been observed between serum 25-hydroxyvitamin D levels and vellus hair counts. It can be estimated that vitamin D deficiency accelerates the downregulation of Wnt/β-catenin signaling which is key pathogenesis of AGA. A small number of patients from single center and absence of control group are limitation of this study. It is also unclear if vitamin D supplementation will increase vellus hair count. However, given the high prevalence of vitamin D deficiency in patient with AGA and the relative safety of vitamin D supplementation, supplement of vitamin D for prevention and treatment of AGA is worth considering. In conclusion, vellus hair counts in AGA are negatively correlated with serum vitamin D levels. Further research to evaluate the effectiveness of vitamin D supplementation will be needed.

Long-term clinical course and outcomes of alopecia areata in children and adolescents

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The prognosis of alopecia areata (AA) is less favorable when onset occurs during childhood. Moreover, when onset of the disease occurs in childhood, the evolution of hair loss is difficult to predict. The long-term outcome of adult AA is reported in few studies but has not been studied adequately in children and adolescents. We investigated the long-term prognosis of AA in children and adolescents. This study included 82 patients under the age of 19 diagnosed with AA. The mean follow-up period was 11.8±2.9 years. Outcome data were collected by reviewing outpatient clinical files or by phone interviews. Among 44 patients with S1 or S2 disease, 21 were free of disease, 14 achieved partial hair regrowth, and 9 were not improved or worsened. Among 18 patients with S3 or S4 disease, 3 were free of disease, 8 showed partial regrowth, and 7 were not improved or worsened. Among the 8 patients with alopecia totalis (AT), 3 still had AT and one had complete hair regrowth. Among the 12 patients with alopecia universalis, 8 maintained their disease, only one achieved total regrowth. Our results suggest that long-term prognosis of AA in children and adolescents seemed to correlate with severity at initial visit. However, even if hair loss at initial visit is not severe, AA may progress to severe form; therefore, the activity of the disease should be considered.

Nivolumab induced alopecia areata : A rare side effect of nivolumab

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Immune checkpoint inhibitors (ICI) are new therapies used for solid and hematologic cancers. They induce activation of CD4 and CD8 cells that target tumor cells and may target unidentified cutaneous antigens, resulting in an inflammatory process after cross-reaction with normal antigens and in immune-related adverse events. Nivolumab (anti-PD-1), one of the ICI, currently used in many cancers, for example hepatocellular carcinoma (HCC), lung cancer, colon cancer, melanoma. With the usage of nivolumab increased, many cutaneous side effects were reported including maculopapular rash, lichenoid reactions, pruritus, vitiligo, bullous disorders, psoriasis exacerbation, hair repigmentation and alopecia areata (AA). Here, we report AA after nivolumab for treatment of HCC.

A 55 years year-old man presented with multiple hairless patch from 1 month ago. He suffered HCC and treated with nivolumab for 6 months after hepatectomy. He treated for hair loss with triamcinolone intra-lesional injection without improvement. We performed skin biopsy on the scalp. Histopathologic findings revealed decreased number of hair follicles on the horizontal section and lymphocyte infiltration on the perifollicular area on the vertical section. Clinico-pathologic findings were agreed with AA. Considering lack of previous history of AA and development of hairless patches with 6 months after nivolumab injection, we diagnosed him as nivolumab induced AA. Treatment included topical steroid, and minoxidil. No regrowth of hair were noted after 4 months of follow up.

Nivolimumab induced AA is rare side effect. Pathogenesis of nivolumab induced AA remain unclear. But our case is likely related to nivolumab, known to induce immune related adverse events, and given in the delay of a few months between introduction and the occurrence of the hair loss. There were several reports about nivolumab induced AA. However, AA due to nivolumab has not yet been reported in Korea. Here, we reports nivolmumab induced AA; rare side effect.

Therapeutic effects of new long acting growth factor cocktail injected with microneedle on the scalp in the patients with androgenetic alopecia: A split study

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As studies on various cytokines that contribute to hair growth and differentiation have been actively conducted in recent years, growth factor cocktail (GFC) in combination with microneedling has been used as an effective and safe treatment for patients with androgenetic alopecia (AGA). However, further research is needed on the more efficient injection method and effective GFC.

This study aims to evaluate the therapeutic effect of new long acting GFC in AGA patients with microneedle. In this study, AGA patients were treated 6 times for a total of 12 weeks at 2-week intervals from the first visit. The scalp was divided into two parts on the right and left, 2.5ml of new long acting GFC was injected on the right and 2.5ml of normal saline on the left was injected with microneedle to a depth of 1.2 mm. A total of 22 patients (12 males and 10 females) were enrolled. Clinical photograph and phototrichogram were performed before the initial treatment and 2 weeks after the sixth treatment to determine the final treatment effect. The phototrichogram images of the right scalp showed increased hair density from 165.9±27.1/cm^2 to 178.7±27.8/cm^2 and diameter from 61.27±10.50μm to 62.18±10.61μm. These results were statistically significant in difference ($p < 0.05$). The phototrichogram images of the left scalp showed that hair density from 176.7±30.6/cm^2 to 176.3±31.3/cm^2 and diameter from 62.18±9.67μm to 59.55±10.00μm. The results treated with normal saline after 12 weeks were not significant in difference from baseline in both hair density and diameter.

The new long acting GFC with microneedling showed its effect for patients with AGA in the time frame of 12 weeks. However, further study is needed on the long term efficacy of new long acting GFC with microneedle and relief of bleeding and pain caused by microneedle.

Correlative analysis of human scalp with scanning acoustic microscopy and histology

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Scanning acoustic microscopy (SAM) is one of the useful ultrasonic techniques which enable non-destructive detecting of physical defects in the field of material science. The SAM also has a potential to be utilized for non-invasive inspection of subsurface structures of biological samples including human skin. The purpose of the study is to investigate the capability of SAM to identify the normal morphological features of human scalp.

The scalp of human cadaver was biopsied and fixed in 4% formalin. The sample was trimmed by 1cm by 1cm and observed under the SAM. The same tissue was paraffin-embedded and processed with Masson's trichrome stain. The histological slides were imaged with light microscopy to correlate with the images obtained from SAM.

The SAM images provide fair identification of morphological characteristics in human scalp including hair follicles, hair tracts, multiple-hair follicular units, sebaceous glands, cutaneous artery and so on. The histological counterpart of each structure was easily identifiable through direct correlation between histologic images of cross- or transverse-sectional view and paired SAM images.

The results indicate that the SAM could be an effective diagnostic modality assisting dermatologists interested in a non-invasive morphological analysis. The currently reported normal characteristics of human scalp under SAM is a mandatory for non-invasive detecting and understanding pathological features of hair disorders including alopecia.

Keywords: Scanning acoustic microscopy, Histology, Skin, Scalp

The role of inflammasome activation in patients with alopecia areata

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Previous studies revealed that aberrant activity of inflammasomes is involved in the pathogenesis of several dermatological diseases such as acne, psoriasis, and vitiligo. In recent study, outer root sheath (ORS) of hair follicle express NLRP3 inflammasomes and may contribute to the pathogenesis in alopecia areata (AA).

This study was conducted for the purpose of evaluating the presence and intensity of NLRP3 immunostaining in lesional skin of AA with the aim of searching for possible correlation between NLRP3 and clinical characteristics, including disease progression.

From 2015 to 2017, biopsy proven AA patients were enrolled. Clinical characteristics were recorded. Peribulbar lymphocyte infiltration and NLRP3 immunostaining were graded. Grade 3 (intense localized staining in ORS) and grade 4 (positive staining in all ORS) were defined as high NLRP 3 expression. The relationship between NLRP3 staining and clinico-histological characteristics was analyzed.

Of 93 patients, 26 were acute stage, 40 were subacute stage, and 27 were chronic stage of AA. High NLRP3 expression was shown in upper (71.0%, 66/93) and lower (36.6%, 34/93) segment of hair follicles of AA patients. High NLRP3 expression in lower segment of hair follicle was significantly associated with recurrent episode, positive family history, acute stage of AA, and better prognosis (P = 0.05, 0.036, 0.000, and 0.003, respectively). Subtype of AA, disease severity and peribulbar infiltration were not associated with high NLRP3 expression.

Our study results suggest that NLRP3 inflammasome may have a role in the early stage of AA pathogenesis and could be useful in discriminating progressive form of AA, or as a prognostic marker.

Comparison of risk allele frequencies of androgenetic alopecia-associated single-nucleotide polymorphisms in different population groups

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Background: Androgenetic alopecia (AGA) is androgen-dependent disease with hereditary features. The prevalence of AGA differs from 80% to 46.3% across races. This difference may based on its genetic causes.

Objective: This study aimed to gain insights into the causes of these differences according to populations and the factors affecting prevalence and pattern differences.

Methods: We collected a total of 257 AGA-associated single-nucleotide polymorphisms (SNPs) from the genome-wide association studies (GWAS) catalog and compared the allele frequency differences in 27 populations using public population frequency in the 1000 Genomes Project phase 3 (n = 2504) and the Korean Reference Genome Database (n = 1722). Additionally, we calculated the composited genetic risk scores across the population groups.

Results: There are certain specific patterns of risk allele frequencies according to races. European and American showed similar patterns while East Asia has distinct patterns differ from them. The prevalence of AGA correlated with the average genetic risk score of the population.

Conclusion: We observed a difference in the allele frequencies of AGA-associated SNPs between the studied populations. This result suggests that the difference in the prevalence of AGA between population groups can be interpreted to some extent by the genotype.

A case of HIV false positive associated with alopecia areata

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A 21-year-old male patient visited our hospital with diffuse round shaped hair loss on scalp from 2 months ago. He had no previous history of hair loss. Based on clinical findings, alopecia areata (AA) was diagnosed, and severity of alopecia tool (SALT) score was 20. In consideration of the patient's acute progression, steroid pulse therapy with 1000mg of methylprednisolone was administered. There were no specific findings in blood tests including antinuclear tests, but reactive finding was found in the HIV screening test. The western blot of the confirmation test showed negative findings, and he has no specific past history, so we considered the result as HIV false positive and continued treatment. However even after that, the patient continued to show reactive finding in the subsequent HIV screening test. Therefore, the authors thought that HIV false positive was related to AA, and we followed up to see if the signal-to-cutoff (S/CO) value of the HIV screening test was correlated with the patient's SALT score change. In fact, the patient showed a similar pattern in the increase and decrease of SALT score and S/CO during the recurrence and recovery of AA for 2 years, and is being followed up until now after explanation to the patient.

According to the pathogenesis of AA, an immune response including T cells occurs due to the loss of immune privilege in hair follicles and the its specific IgG auto-antibodies can be produced as secondary autoimmune event. Our institution's 4th generation HIV screening test product detects HIV IgM/IgG and p24 Ag, but false positive may appear if there is immunoglobulin that cross reacts with synthetic HIV antigen. Therefore, authors suggest that autoantibodies generated in AA pathogenesis may have been the cause. Here, authors report a rare case of HIV false positive associated with AA and its severity.

A case of autosomal recessive woolly hair 2 associated with novel compound heterozygous mutation in lipase H (LIPH) gene

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A 3-year-old girl was presented with decreased hair density and abnormal hair growth. Her hair density and thickness was unremarkable when she was born. However, since the age of 1, her hair has become thinner and tightly curled, grown slowly, and stopped growing at a few centimeters. Physical examination showed decreased hair density with lightly pigmented, curly and thin hairs on scalp and shortened hair length around 5 cm while eyebrows and eyelashes were not affected. There was no sanguinity between the parents and family member except proband showed straight hair with normal density. Light microscopy revealed thin and hypopigmented hair with axis rotation. On scanning electron microscopy, most of the hair cuticles were presented as brittle and erosive scale on surface and splintering. Whole exome sequencing revealed compound heterozygous mutation of c.736T>A and c.1234C>T in LIPH gene. On the basis of these results, she was diagnosed with 'Autosomal recessive woolly hair 2 with or without hypotrichosis' (ARWH2) (MIM#604379) and showed remarkable response for hair density with topical minoxidil, but not for hair length.

ARWH is a rare hereditary hair disorder characterized by sparse, short, curly hair with wide clinical spectrum. It occurs as a result of the mutation of the genes, LPAR6 (ARWH1), LIPH (ARWH2) or KRT25 (ARWH3). LIPH gene encodes PA-PLA1α that produces lysophosphatidic acid and it plays an important role in human hair growth. LIPH mutation c.736T>A was classified as likely pathogenic in ACMG guideline and previously reported as homozygous and heterozygous genotype in ARWH2 in Japan while c.1234C>T was not listed in database (ClinVar) with current classification as a variant of uncertain significance. It is significant that our case is the first case of ARWH2 with novel compound heterozygous mutation.

Mesenchymal stem cells antagonize IFN-induced proinflammatory changes and growth inhibition effects via Wnt/βCatenin and JAK/STAT pathway in human outer root sheath cells and hair follicles

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Mesenchymal stem cell therapy (MSCT) has been shown to be a new therapeutic option for treating alopecia areata (AA). Outer root sheath cells (ORSCs) play key roles in maintaining the hair follicle structure and supporting the bulge area. In human ORSCs (hORSCs), the mechanism for this process has not been extensively studied. In this study, we aimed to examine the influence of human hematopoietic mesenchymal stem cells (hHMSCs) in the hORSCs in vitro model of AA and determine the mechanisms controlling efficacy. Interferon-gamma (IFN-γ) pretreatment was used to induce an in vitro model of AA in hORSCs. The effect of MSCT on the viability and migration of hORSCs was examined using co-cultures, the MTT assay, and migration assays. We investigated the expression of molecules related to the Wnt/β-catenin pathway, JAK/STAT pathway, and growth factors in hHMSC-treated hORSCs by reverse transcription-polymerase chain reaction (RT-PCR) and Western blot analyses. hHMSCs increased hORSC viability and migration when they were co-cultured. hHMSCs reverted IFN-γ-induced expression of proinflammatory markers-including NLRP3, ASC, caspase1, CXCL-9 through 11, IL-1β, and IL-15—and upregulated several growth factors and hair stem cell markers. hHMSCs activated several molecules in the Wnt/β-catenin signaling pathway, such as in the Wnt families, β-catenin, phosphorylated GSK-3β and cyclin D1, and suppressed the expression of DKK1 induced by IFN-γ in hORSCs. hHMSCs suppressed the phosphorylation of JAK1 to 3, STAT1, and STAT3 compared to the controls and IFN-γ-pretreated hORSCs. These results demonstrate that hHMSCs increased hORSC viability and migration in the in vitro AA model. Additionally, MSCT definitely stimulated anagen survival and hair growth in an HF organ culture model. MSCT appeared to be associated with the Wnt/β-catenin and JAK/STAT pathways in hORSCs.

Detection of genetic mutation and functional study in Korean alopecia areata patients

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Alopecia areata (AA) is a chronic, relapsing hair-loss disorder that is considered a T-cell-mediated autoimmune disease; however, its pathogenesis remains poorly understood. Previous genome-wide association studies have identified several susceptibility genes, most of which are implicated in autoimmunity. To identify new genetic variants and further elucidate the genetic basis of AA, we performed whole-exome sequencing in a cohort of 50 cases with severe AA (alopecia totalis and alopecia universalis). In addition, we tested for associations between disease status (age at onset, severity of disease and treatment outcome) and common individual variants. A total of 352,887 variants were identified and after excluding nongenic or intronic variants, 8,210 variants were selected. Variants were prioritized and filtered according to variant database information regarding disease susceptibility and impact on protein structure. Finally, a total 34 genes, with 39 putative causative variants unique to AA, were identified. When the candidate genes were categorized by gene ontology, 12 variants were located within immune-related genes. Among the candidate genes, we examined expression of PINK1, PIGT, COL4A4, and MT-ND1 in skin cells. We have selected PINK1 for functional study in pathogenesis of alopecia areata. When outer root sheath (ORS) cells were treated with poly(I:C) and IFN-γ, PINK1 was increased in mitochondria showing induction of mitophagy in ORS cells. Moreover, Carbonyl Cyanide Chlorophenylhydrazone, which is the inducer of mitophagy, was treated in ORS with poly(I:C) and IFN-γ, inflammation induced by inflammasome was subsided. Taken together, these results indicate that mitophagy might play a role in the pathogenesis of alopecia areata, and further studies will be necessary to clarify the physiologic significant of mitophagy mediated inflammation in alopecia areata.

Non-thermal atmospheric pressure plasma activates Wnt/β-Catenin signaling in dermal papilla cells

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Hair loss can cause significant psycho-social distress for the affected patients, however therapeutic options are limited. Non-thermal atmospheric pressure plasma (NTAPP) is a partially ionized gas that contains electrically charged particles at atmospheric pressure. Recent studies showing potential biological benefits of NTAPP prompted us to hypothesize that NTAPP may have a stimulatory effect on hair growth.

We designed an NTAPP-generating apparatus applicable to in vitro and in vivo experiments. To screen biological effects of NTAPP, we performed RNA sequencing on NTAPP-treated dermal papilla (DP) cells. Gene ontology analysis suggested transcriptomic changes associated with Wnt signaling pathway in NTAPP-treated hDP cells. qRT-PCR and Western blot confirmed that NTAPP treatment increased the expression levels of Wnt-β-catenin pathway–related genes and the protein levels of β-catenin, p-GSK3β, and cyclin D1. Moreover, the pre-treatment of endo-IWR1 reduced the levels of these proteins, and attenuated the nuclear translocation of β-catenin.

Using the human hair follicle (hHF) organ culture model, we found NTAPP treatment induced the activation of β-catenin in DP cells of hHFs. To test the in vivo effects of NTAPP, the shaved back skin of C57BL/6 mice was treated daily with NTAPP. NTAPP-treated mice exhibited increased anagen induction and hair growth and the histological analyses showed that NTAPP induced the telogen-anagen transition. NTAPP treatment also significantly increased the protein levels of β-catenin, p-GSK3β, p-AKT, and cyclin D1 in the exposed mouse skin. These data indicate that NTAPP promotes hair growth in mice via activation of the β-catenin signaling pathway.

In conclusion, our study suggests that NTAPP activates Wnt signaling by stimulating β-catenin in DP cells, which may be a potentially safe and non-pharmacological therapeutic intervention for hair loss.

Efficacy of DNA/RNA fragments for the treatment of androgenetic alopecia

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Background: Administration of DNA/RNA fragments that induce RNA interference has been investigated in various diseases, including skin diseases, as a potential therapeutic option. Interfering DNA/RNA molecules can efficiently inhibit expression of a certain target gene, without considerable safety concerns. Androgenic alopecia (AGA) is known to be caused by a combination of genetics and sensitivity to dihydrotestosterone (DHT), which binds to androgen receptor (AR) to induce a series of biomolecular changes leading to hair loss.

Objective: To evaluate the therapeutic potential of DNA/RNA fragments for the treatment of AGA.

Methods: DNA/RNA fragments were developed so that they can inhibit the expression of AR by dermal papilla (DP) cells. DHT-sensitive DP cells, DHT-sensitive mouse model, and ex vivo scalp tissues were stimulated with DHT with or without the resulting DNA/RNA fragments, and the change in expression of AR as well as other molecules implicated in hair growth were evaluated. Also, the mean diameter of hair bulb and the proportions of telogen hair in ex vivo scalp tissues were determined after exposure to DHT with or without DNA/RNA fragments.

Results: No significant toxicity after treatment with DNA/RNA fragments was observed. The expression of AR in DP cells was effectively downregulated by treatment with DNA/RNA fragments. In contrast, expression of β-catenin was upregulated by treatment with DNA/RNA fragments. The proportion of telogen hair was significantly lowered by treatment with DNA/RNA fragments, and the mean hair bulb diameter was longer in the DNA/RNA fragments-treated group than the control stimulated with DHT only.

Conclusion: Effective downregulation of AR expression and prevention of DHT-induced changes in hair cycle and hair diameter could be achieved by treatment with DNA/RNA fragments. Thus, DNA/RNA fragments could be used as a novel therapeutic option for the treatment of AGA.

Dickkopf-related protein 2 promotes the hair growth via stimulating Wnt/β-catenin signaling pathway in human dermal papilla cells and hair follicles

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Background: Wnt/β-catenin signaling pathway plays essential roles in development, initiation and growth of Hair follicle. DKK (Dickkopf-related protein) gene family encode secreted proteins modulating Wnt/β-catenin signaling pathway. It is reported that DKK-1 promotes regression of hair follicles and is a pathogenic mediator involved in male pattern baldness. However, the role of DKK-2 on hair growth has not been studied yet.

Objective: This study is aim to investigate the effects of rhDKK-2 on human hair growth in vitro using cultured human DPCs and ex vivo organ cultures of human hair follicles.

Methods: We evaluated cell proliferations in cultured human DPCs by by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide assay after treatment of PBS, dihydrotestosterone 25μM, minoxidil 1μM, rhDKK-1(50 ng/ml, 100 ng/ml) and rhDKK-2(50 ng/ml, 100 ng/ml). The expression of hair growth related factors and Wnt/β-catenin target genes were investigated by western blot and real-time polymerase chain reaction. In organ culture of hair follicles, the changes of hair shaft length were measured for 8 days.

Results: Treatment with rhDKK-2 significantly increased the proliferation of human DPCs in dose-dependent manner ($p < 0.05$), which was comparable with minoxidil 1μM. Moreover, rhDKK-2 increased the expression of Wnt/β-catenin target genes, phosphorylated-ERK, Bax, Bcl-2, cyclin D and downregulated BMP2 gene. In organ culture, rhDKK-2 significantly enhanced hair shaft elongation.

Conclusion: Our data strongly suggest that rhDKK-2 could promote the hair growth by proliferating human DPCs via upregulating Wnt/β-catenin signaling pathway.

Efficacy of hair growth after use of shampoo and hair tonic composed of morus alba root extract, ficus carica (fig) fruit extract, camellia sinensis (green tea) leaf extract

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Background: There are many shampoos and tonics which claim to stop hair loss and promote hair growth. But they have a few scientific investigations.

Objective: The objective of this study was to precisely investigate the efficacy of the products according to clinical-dermatological test criteria.

Method: Monocentric clinical trial (Dermatest GmbH Engelstr, Münster, Germany) over a period of 6 month in total including intermediate analysis after 3 month. Analysis of hair by TrichoScan HD system (DermoScan GmbH, Germany) and quantification of hair loss by counting out fallen hair after combing were executed by dermatologists. The study was carried out with 4 female and 16 male subjects aged 25 years up to 65 years, according to the inclusion and exclusion criteria.

Results: The efficacy of the test products to reduce the hair loss was investigated by counting the out fallen hair after combing by a standardised comb. In mean over the 20 subjects a decrease of out fallen hair by 20 % was determined after 3 month application of both test products. However, the standard deviation of corresponding 20 change rates was 3fold bigger (62 %). After 6 month applying both test products a reduction of out fallen hair by 53 % was detected in mean over the 20 subjects. Even the corresponding standard deviation was 42 %.

Conclusion: The test products were applied over a period of 6 month by 20 subjects once daily onto the hair and scalp. After 6 month application of test products a reduction of out fallen hair by 53 % was quantified in the mean of the 20 subjects. The corresponding 20 results about change of out fallen hair quantity exhibited a standard deviation of 42%.

Two cases that mimic alopecia areata and that can be clinically confused as not alopecia areata

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Alopecia areata (AA) is a common autoimmune non-scarring alopecia, which typically presents with smooth, well-circumscribed, round hair loss patches on the scalp. In addition to this well-demarcated localized form, AA can also present in a diffuse generalized pattern that resembles androgenic alopecia or telogen effluvium (TE). Also, postmenopausal women with frontotemporal recession may present a diagnostic challenge, as frontal fibrosing alopecia (FFA) and AA may be clinically difficult to distinguish. Herein, we report two cases that mimic alopecia areata and that can be clinically confused as not AA.

A 69-year-old woman presented with asymptomatic alopecic patches on both temporal scalp for several years. Previous treatments with 15 times of triamcinolone intralesional injection every two weeks resulted in no improvement. Dermoscopic examination revealed loss of follicular ostia and mild perifollicular erythema. A skin biopsy showed decreased number of hair follicles and mild perivascular lymphohistiocytic infiltration in the upper dermis. Based on the clinical and histological findings, she was diagnosed with FFA and was treated with 10.0 mg/dl triamcinolone injection and topical steroid.

A 29-year-old woman presented with asymptomatic, diffuse alopecic patches on the scalp for 8 months. The hair pull test performed at the vertex area showed a positive result. She had a history of delivery 8 months ago. Dermoscopic examination revealed yellow dots and short vellus hairs. A skin biopsy showed increased numbers of miniaturized telogen and catagen follicles with peribulbar lymphocytic infiltration. Based on the clinical and histological findings, she was diagnosed with diffuse AA and was treated with cyclosporine, diphenylcyclopropenone (DPCP), topical steroid, and topical minoxidil for 6 months.

Since AA can be misdiagnosed as TE and scarring alopecia , skin biopsy can be helpful for confirmation. Furthermore, trichoscopy can be a valuable tool to help differential diagnosis between AA and FFA.

Case series of severe alopecia areata improving with novel treatment modality - JAK inhibitor

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Janus kinase (JAK) inhibitors are small molecules that are capable of blocking T-cell-mediated inflammation. According to recent mechanistic data, JAK-mediated pathways play a significant role in maintaining the autoreactive CD8+ T-cell infiltrate in alopecia areata, and the inhibition of these pathways with JAK inhibitors can lead to a reversal of alopecia areata. Herein, we report three cases of severe alopecia areata improving with JAK inhibitor.

A 40-year-old man (Patient 1) presented with diffuse hair loss on the scalp for 20 years. Previous treatments with systemic steroid, cyclosporine, topical minoxidil, diphenylcyclopropenone (DPCP), and triamcinolone intralesional injection (ILI) resulted in no improvement.

A 25-year-old man (Patient 2) presented with diffuse hair loss on the scalp and eyebrows for several years. Previous treatments with cyclosporine, topical steroid, DPCP, and ILI resulted in no improvement.

A 25-year-old woman (Patient 3) presented with diffuse hair loss on the scalp for 3 years. Also, loss of eyebrows and other body hair occurred recently. Previous treatments with cyclosporine, topical steroid, DPCP, and ILI resulted in no improvement. She had no specific history other than taking hormonal medication for Polycystic ovarian syndrome.

The initial SALT score of three patients were 100%, and they all started treatment with once-daily JAK inhibitor. After 52 weeks of treatment, all three patients showed significant improvement with SALT score 40%, 72%, and 2% in patient 1, 2, and 3, respectively. Furthermore, eyebrows and other body hair were also improved in Patient 2 and Patient 3,.

In our cases, it has proven that JAK inhibitors have shown a good treatment outcome in refractory patients with severe alopecia areata. Long-term efficacy and safety of JAK inhibitors should be further verified in the future.

A case of alopecia areata in a patient with type I Pityriasis rubra pilaris

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Alopecia areata (AA) is an autoimmune disorder in association with other diseases, such as atopic dermatitis, vitiligo, and psoriasis. Pityriasis rubra pilaris (PRP) is a papulosquamous disease that results from abnormal activation of inflammatory pathways. There have been a few cases of AA patients with PRP, but the relation between them is unclear. To the best of our knowledge, there have been no cases of co-occurrence reported in Korea. Herein, we report a case of AA in a patient with type I PRP.

A 58-year-old man presented with multiple erythematous follicular papules and scaly plaques on both legs with diffuse keratotic thickening on both palms and soles for several months. There was no history of other diseases, including viral infection, and drug intakes. Laboratory findings were within normal limits. Histopathologic findings showed parakeratosis, acanthosis, and spongiosis in the epidermis. Based on the clinical and histological findings, he was diagnosed with type I PRP, and started treatment with oral and topical steroid, vitamin D3 analogue, oral alitretinoin, and urea cream.

After one week, the lesions showed remarkable improvement, but multiple diffuse alopecic patches appeared. The Severity of Alopecia Tool score was 30%. Histopathologic finding on the scalp showed decreased hair follicles and peribulbar lymphohistiocytic infiltration. Based on the clinical and histological findings, he was diagnosed with AA and started to use oral cyclosporine and topical minoxidil.

We herein described an unusual case of AA in a patient with type I PRP. It is crucial to be aware that AA can occur with PRP and identifying the mechanism would facilitate the treatment of refractory AA and PRP.

Interactions between autologous hematopoietic mesenchymal stem cells from healthy donors and peripheral blood mononuclear cells of severe alopecia areata patients

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Alopecia areata (AA) is an autoimmune condition related to the collapse of immune privilege of the hair follicle. Certain AA population present severe clinical manifestations such as total scalp hair or body hair loss. The aim of this study was to assess the effects of autologous hematopoietic mesenchymal stem cells (hHMSCs) from healthy donor on peripheral blood mononuclear cells (PBMCs) of severe AA patients focusing on the cell fraction of Th1, Th17 and Treg cells. PBMCs of 10 AA patients and 8 healthy controls were collected. Levels of Th1, Th17 and Treg cell subsets in PBMCs were determined via flow cytometry at baseline, activation status, and after co-culture with hHMSCs in activation status. All participants were severe AA patients with the Severity of Alopecia Tool score ≥50 in this study and in the treatment-refractory chronic stage with long disease duration. Their Th1, Th17 and Treg cell fraction (%) were all lower at the baseline compared to healthy controls. When stimulated with CD3, the levels of Th1 and Treg cells of AA patients rose sharply compared to baseline, whereas the cells of healthy controls rose slightly. On the while, Th17 cell ratio was less affected by stimulation in both patients and controls. Co-culture with hHMSCs slightly decreased the activation levels of Th1 cells compared to activated control in AA patients. Whereas Treg cells were markedly induced by autologous hHMSCs treatment in AA patients compared to activated control, these changes were not prominent in health controls. The change of Th17 cell fraction after hHMSCs exposure was not significant.

hHMSCs treatment showed strong efficacy in inducing Treg cells in all severe AA patients ex vivo culture condition. This study suggests the therapeutic potential of autologous hHMSC treatment to induce Treg cells in severe AA patients in chronic stage.

The effects of human mesenchymal stem cells treatment on the alopecia areata mice models

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Mesenchymal stem cells (MSC) are multipotent cells derived from bone marrow have been shown to exhibit immunosuppressive properties in several studies.

It is expected that MSC can function as a hair loss treatment by suppressing autoimmune function, and we tried to find out this through an alopecia areata(AA) mouse model.

MSC was administered to Interferon-gamma (IFN-γ)-induced AA model mice to compare the differences in inflammatory cytokines. In the MSC-treated group, the number of inflammatory cells decreased and mRNA levels of inflammatory cytokines were also decreased. The MSC treatment also enhanced various growth factors at mRNA levels. This study provided basic data of pathomechanism of MSC treatment in AA mice model, which can be used for the future hair loss research.

Pathogenic Th17 cells, CD8+CD69+CD49a- tissue-resident memory T cells, and CD8+ common-γ receptor+ natural killer cells express IL-17 to a greater extent than IFN-γ under the Foxp3+ memory regulatory T cell-depleted microenvironment in patients with chronic alopecia areata

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Introduction: Alopecia areata(AA) is an autoimmune disease resulting from the attack of hair follicle(HF) through a T-cell-mediated mechanism. If there is a depletion of memory regulatory T cells(TRM) in HFs, it could be related to patchy hair loss and may affect AA pathogenesis.

Objective: We investigated the possible role of tissue-resident memory T cells and mTregs, compared to cytotoxic T lymphocytes and Th17 lymphocytes, in the immunopathogenesis of chronic AA.

Methods: 367 patients with AA in Dong-A University Hospital between January 1994 and April 2019 were retrospectively reviewed. Paraffin sections were obtained using the samples collected from nine patients with AA and classified according to the histopathological grading of Uno & Orecchia's classification. The slides were photographed using fluorescence microscopy.

Results: The number of lesional Foxp3+ Tregs was significantly decreased with an increase in the severity of histopathological gradings at both the hair bulge and hair bulb. We postulated that cytotoxic T cells and CD8+CD69+CD49a- TRM cells were responsible for the development of chronic AA lesions under the influence of HF mTregs. The number of CD8+CD69+ TRM cells at both the HF bulge and bulb was increased with the severity of histopathological grades. IL-17 was expressed in a denser pattern around the hair bulge with more severe histopathological grading, but IFN-γ was expressed only at the hair bulge of type 1 AA. Lesional IL-17 around the hair bulb also increased with the severity of histopathological grade. In contrast, IFN-γ was expressed in the hair bulb only in type 1 AA.

Conclusions: Insidious destruction of bulge stem cells and hair bulb matrix stem cells, which is mediated by Th17 lymphocytes and cytotoxic T lymphocyte infiltration, results in more severe hair loss in patients with chronic AA. IL-17 may play a more important role in the pathogenesis of AA than IFN- γ.

대한모발학회

1. 회칙
2. 임원명단
3. 연혁
4. 학술대회 전시 및 광고회사

KHRS
The Korean Hair Research Society

대한모발학회 회칙

제 1 장 총 칙

제 1 조 (명칭) 본회는 대한모발학회(The Korean Hair Research Society)라 하며 대한피부과학회의 산하학회이다.

제 2 조 (구성) 본회는 모발 및 모발과 관련된 질환을 다루고 연구하는 사람으로 구성한다.

제 3 조 (목적) 본회는 모발에 대한 연구, 교육 및 학술활동을 수행하고 회원 간의 친목을 도모함을 목적으로 한다.

제 4 조 (사업) 본회는 전항의 목적을 달성하기 위하여 다음과 같은 사업을 수행한다.

1. 총회 및 학술대회 개최
2. 초록집, 학술지 및 소식지의 발간
3. 모발 및 모발질환에 대한 연구, 교육 등 제 문제에 대한 사업
4. 국내외 관련 학술단체와의 교류 및 제휴
5. 기타 본 학회 목적 달성에 필요한 사업

제 2 장 회 원

제 5 조 (자격) 본회의 회원은 모발 관련 진료 및 연구에 종사하거나 관심을 가지고 본 학회의 취지에 찬동하는 자로서 소정의 입회 수속을 밟고 이사회의 의결을 거 쳐 총회에서 인준을 받은 자로 한다.

제 6 조 (구분) 본회의 회원은 다음과 같이 구분한다.

1. 정회원: 대한피부과학회 정회원 자격자로 본 회 목적에 찬동하는 자로한다.
2. 명예회원: 모발 관련 진료 및 연구 업적이 탁월하고 본 회 발전에 공헌이 지대한자로 한다.
3. 연구회원: 생명과학 관련분야에 종사하는 박사학위 소지자이거나 이 에 준하는 경력자로 본 회 목적에 찬동하는자로 한다.
4. 전공의준회원: 대한피부과학회 준회원 자격자로 피부과 수련병원에서 수련 받는 전공의로 한다.
5. 연구준회원: 정회원 또는 연구회원의 지도를 받거나 생명과학 관련분야에 종사하는 연구원 또는 이에 준하는 경력자로 본 회 목적에 찬동 하는 자로 한다.

제 7 조 (의무) 회원은 본 회의 회칙, 제 규정 및 결의 사항을 준수하여야 하고, 정회원, 명예회원 및 연구회원은 회비 및 기타의 부담금을 납부할 의무가 있다.

제 8 조 (권리) 모든 회원은 본회에서 발간하는 소식지 및 학회지를 배부 받을 권리가 있으며 정회원은 선거권, 피선거권 및 기타 소정의 의결권을 가진다.

제 9 조 (제명) 본회의 의무를 준수하지 않거나 명예를 훼손한 회원은 이사회를 거쳐 총회의 인준을 받아 제명할 수 있다.

제 3 장 임 원

제 10 조 (임원) 본회는 회장, 부회장 3명 이내, 총무, 학술, 교육, 재무, 홍보, 간행정보, 기획, 의무, 대외협력, 국제관계, 무임소 상임이사, 간사, 감사 2명 및 약간 명의 고문을 두며 이사의 정원은 30명 내외로 한다.
무임소 상임이사와 간사는 약간명으로 한다.

제 11 조 (선임)

1. 회장, 감사는 총회에서 선출한다.
2. 부회장, 상임이사 및 상임부이사는 회장이 위촉한다.
3. 이사는 상임이사회에서 추천하여 회장이 위촉한다.
4. 고문은 회장이 위촉한다.

제 12 조 (임기) 임원의 임기는 2년으로 하며 연임할 수 있다.

전임자의 유고로 인해 보선된 임원의 임기는 전임자의 잔여 임기로 한다.

제 13 조 (직무)

1. 회장은 본회를 대표하여 업무를 총 관리하고 총회, 이사회의 의장이 된다.
2. 부회장은 회장의 유고시 그 직무를 대행하며, 본 회 운영의 주요한 사항을 심의하고 제반 업무를 집행한다.
3. 총무이사는 본회 운영의 주요한 사항을 심의하고 제반 업무를 집행한다.
4. 학술이사는 학술 모임에 관한 업무를 집행한다.
5. 교육이사는 회원 교육에 관한 업무를 집행한다.
6. 재무이사는 재무에 관한 업무를 집행한다.
7. 홍보이사는 홍보 및 대중 매체에 다루어지는 업무를 집행한다.
8. 간행정보이사는 간행 및 정보에 관한 업무를 집행한다.
9. 기획이사는 기획에 관한 업무를 집행한다.
10. 의무이사는 의무에 관한 업무를 집행한다.
11. 대외협력이사는 대관 및 대한피부과학회에 관한 업무를 집행한다.
12. 국제관계이사는 국제적 교류에 관한 업무를 집행한다.
13. 무임소이사는 특정 사업이나 지속적 업무를 집행한다.
14. 간사는 상임이사의 업무를 보좌한다
15. 감사는 본 학회의 재산 상황과 사업과 관련된 사항을 감사하고 이를 총회에 보고한다.
16. 이사는 이사회를 구성하여 본 학회 운영의 주요 사항을 심의 의결한다.
17. 고문은 본 학회의 운영 전반에 대한 자문을 한다.

제 4 장 회 의

제 14 조 (구분) 본회에는 총회와 이사회, 상임이사회를 둔다.

제 15 조 (총회)

1. 정기총회는 연 1 회 회장이 소집한다. 단 정회원 5분의 1이상의 요구나 이사회의요청이 있으면 임시총회를 소집하여야 한다.
2. 총회는 출석 정회원으로 성립되고 재석 인원 과반수로 의결한다.
3. 총회는 다음과 같은 사항을 의결한다.
   (1) 회장, 감사 선출
   (2) 예산과 결산의 인준
   (3) 회칙 개정의 인준
   (4) 기타 이사회에서 제출한 사항

제 16 조 (이사회)

1. 이사회는 임원과 이사 및 부이사로 구성하며 회장이 의장이 되어 회의를 진행한다.
2. 이사회는 과반수 출석으로 성립하고 재석 인원 과반수로 의결한다.
3. 이사회는 총회에 제출하여 인준 또는 의결할 사항, 제 규정의 제정과 개정, 회원의 자격과 제명 및 기타 필요한 사항에 대하여 심의 의결 또는 인준한다.

제 17 조 (상임이사회)

1. 상임이사회는 상임이사로 구성하며 회장이 의장이 되어 회의를 진행한다.
2. 상임이사회는 이사회 및 총회에 제출하여 인준 또는 의결할 사항을 포함하여 회무 전반에 관한 사항을 심의 의결 또는 인준하여 집행한다.

제 18 조 (각종 위원회)

1. 이사회의 의결을 거쳐 각종 위원회를 둘 수 있다.

제 5 장 재 정

제 19 조 (재원) 본 회의 재원은 회비, 입회비, 찬조금 및 기타 수입금으로 한다.

제 20 조 (회계년도) 본 회의 회계연도는 매년 정기 총회 일에서 다음 정기 총회 전일까지로 한다.

제 21 조 (임기) 본 회의 수지 결산은 감사의 감사를 거쳐 차기 정기 총회에 보고한다.
회계연도 결산 후 남은 잉여금은 배분하지 않는다.

제 6 장 부 칙

제 22 조 본 회칙에 규정되지 않은 세칙은 일반 관례에 준한다.

제 23 조 본 회칙의 개정은 이사회의 심의를 거쳐 총회의 인준을 받아야 한다.

제 24 조 본 회칙은 공포일로부터 시행한다.

2004. 7. 1. 제정
2006. 5. 28. 개정
2009. 5. 24. 개정
2010. 10. 16. 개정
2012. 6. 3. 개정
2012. 10. 20. 개정
2014. 10. 18. 개정
2016. 10. 15. 개정
2018. 10. 20. 개정

대한모발학회 임원명단

고 문	노병인, 임철완, 박장규, 강진수, 김도원, 심우영, 이원수, 강훈
회 장	최광성
부 회 장	김문범
총 무 이 사	권오상
국제관계이사	허창훈
학 술 이 사	이양원
재 무 이 사	김상석
교 육 이 사	유박린
기 획 이 사	이상훈
간행정보이사	김도영
홍 보 이 사	원종현
대외협력이사	김정은
의 무 이 사	박병철
무 임 소 이 사	김범준
무 임 소 이 사	서수홍
무 임 소 이 사	김민성
무 임 소 이 사	박현선
무 임 소 이 사	이영
무 임 소 이 사	장용현
총 무 간 사	최지웅
학 술 간 사	신현태
감 사	이동윤
감 사	조성빈
이 사	강광영, 계영철, 김규한, 김기호, 김정철, 김창덕, 김효진, 노윤우, 민복기, 박성욱, 박원석, 박진, 방철환, 서구일, 성영관, 신기식, 신정원, 오지원, 윤태영, 이세원, 이승호, 이인준, 이종록, 임이석, 장승호, 전지현, 조성환, 조항래, 최유성, 황성주

대한모발학회 연혁

대한모발학회 소개

대한모발학회는 1998년 10월 29일 대한피부과학회 내에 모발연구분과위원회를 설립하기 위한 발기인 모임을 가진 것을 시작으로 하여 태동이 되었습니다. 이후 모발연구분과위원회의 주도로 매년 대한피부과학회 춘추계학술대회 때마다 모발심포지엄을 개최하여 왔습니다. 이후 기존의 모발연구분과위원회를 확대 개편하여 대한모발학회를 창립하기로 하고 2004년 7월 11일 제주도 샤인빌 호텔에서 창립총회를 가졌습니다. 초대회장으로 노병인 교수를 비롯한 임원진이 선출되었고, 이후 본격적인 활동을 시작하였습니다. 현재 대한모발학회는 북미모발학회, 유럽모발학회, 일본모발학회와 어깨를 겨루는 세계적인 모발학회로 성장하게 되었으며 2006년 5월 28일 제2대 회장으로 박장규 교수, 2008년 5월 25일 제3대 회장으로 임철완 교수, 2010년 6월13일 제4대 회장으로 강진수 강한피부과 원장, 2012년 6월 3일 제5대 회장으로 김도원 교수, 2014년 5월 17일 제6대 회장으로 심우영 교수, 2016년 5월 29일 제7대 회장으로 이원수 교수, 2018년 5월 27일 제8대 회장으로 강훈 교수가 선출되어 임기동안 학회를 훌륭히 이끌었습니다.

현재는 2020년 5월 30일 대한모발학회 총회에서 제9대 회장으로 최광성 교수가 선출되어 제9기 집행부를 구성하여 회무를 담당하고 있습니다.

학술활동 소개

1. 대한모발학회 학술대회

대한모발학회 학술대회는 1년에 한 번 개최되며, 해외학자 초청강연, 특강 및 교육 강연, 각종 구연 및 포스터 연제 발표 등으로 이루어지는 대한모발학회의 꽃이라고 할 수 있습니다. 제 1차 및 제 2차 심포지엄을 거쳐 2006년 제 3차 대회 때부터 정식 학술대회의 면모를 갖추게 되었습니다.

1) 제1차 대한모발학회 심포지엄
- 2004년 11월 7일 밀레니엄 힐튼 호텔
- 탈모에서 Mesotherapy 외 9 강좌

2) 제2차 대한모발학회 심포지엄
- 2005년 6월 19일 밀레니엄 힐튼 호텔
- 탈모증의 진단 외 12강좌

3) 제3차 대한모발학회 학술대회
- 2006년 5월 28일 밀레니엄 힐튼 호텔
- 원형탈모증의 임상적 특징 외 8강좌 및 일반연제

4) 제4차 대한모발학회 학술대회
- 2007년 5월 27일 밀레니엄 힐튼호텔
- 원형탈모증의 원인과 발생기전 외 10강좌 및 일반연제

5) 제5차 대한모발학회 학술대회
- 2008년 5월 25일 밀레니엄 힐튼호텔
- 모낭과 안드로겐 외 15강좌 및 일반연제

6) 제6차 대한모발학회 학술대회
- 2009년 5월 24일 밀레니엄 힐튼 호텔
- 모낭의 발생 외 12 강좌 및 일반연제

7) 제7차 대한모발학회 학술대회
- 2010년 6월 13일 밀레니엄힐튼호텔
- New insights into hair biology 외 14 강좌 및 일반연제
- 모발이식 워크샵 및 직원교육

8) 제8차 대한모발학회 학술대회
- 2011년 9월 18일 코엑스 회의실 Hall E (3층)
- Congenital atrichia and hypotrichosis 외 16 강좌 및 일반연제
- Hair clinic workshop 및 Hair research workshop

9) 제9차 대한모발학회 학술대회
- 2012년 6월 3일 백범김구기념관
- Alopecia areata: biomarkers and clinical trials, quest for a safe and effective therapy 외 10 강좌 및 일반연제
- Rumination on Diagnosis and Treatment Options

10) 제10차 대한모발학회 학술대회
- 2013년 5월 26일 백범김구기념관
- Latest news about the genetics of alopecia areata 외 18 강좌 및 일반연제
- What's new?: Hair clinic and hair research

11) 제8차 세계모발연구학회 (World Congress for Hair Research)
- 2014년 5월 14-17일 제주국제컨벤션센터
- 주최: 대한모발학회
- 대회장: 이원수
- 참가자: 871명(국내-452, 국외-265, exhibitor; 154)
- Malassezia yeast and seborrheic dermatitis 외 238 강좌 및 일반연제

12) 제11차 대한모발학회 학술대회
- 2015년 5월 31일 가톨릭대학교 서울성모병원 지하1층 대강당
- Wnt/β-catenin signaling controls proliferation but not survival of hair follicle stem cells외 15 강좌 및 일반연제

13) 제12차 대한모발학회 학술대회
- 2016년 5월 29일 가톨릭대학교 서울성모병원 지하1층 대강당

14) 제13차 대한모발학회 학술대회
- 2017년 5월 28일 연세의료원 종합관 337호, 331호

15) 제14차 대한모발학회 학술대회
- 2018년 5월 27일 연세의료원 종합관 337호, 211호

16) 제15차 대한모발학회 학술대회
- 2019년 5월 26일(일) 연세대학교 백양누리 그랜드볼룸

17) 제16차 대한모발학회 학술대회
- 2020년 8월 30일(일) 서울드래곤시티 그랜드볼룸

2. Hair Forum

2001년 시작하여 해마다 참석하는 인원이 늘어나고 있는 Hair Forum은 모발학회 회원들 간의 격식 없는 모임입니다. 이는 자유로운 토론과 회원 상호간의 친목도모를 위하여 마련되고 있으며, 주로 진단 및 치료가 어려운 증례에 대한 토론, 그동안 연구했던 내용 발표, 해외모발학회 참관기 소개 등 다른 회원들과의 의견공유를 위해서 밤늦은 시간까지 진행됩니다. 최근에 개최된 Hair Forum 현황은 다음과 같습니다.

2002 대한모발학회 제1차 Hair Forum
일시: 2002년 8월 23일
장소: 대전 유성 리베라 호텔
모발의 색소이상에 나타나는 모구의 변화 외 8건 발표

2003 대한모발학회 제2차 Hair Forum
일시: 2003년 8월 23일
장소: 대전 유성 리베라 호텔
원형탈모증 환자 400명의 임상적 고찰 외 8건 발표

2004 대한모발학회 제3차 Hair Forum
일시: 2004년 8월 28일
장소: 대전 유성 스파피아 호텔
모낭유래세포에서의 androgen receptor, estrogen receptor의 발현 양상 외 13건 발표

2005 대한모발학회 제4차 Hair Forum

일시: 2005년 8월 20일
장소: 대전 유성 스파피아 호텔
원형탈모증 환자 400명의 임상적 고찰 외 8건 발표

2006 대한모발학회 제5차 Hair Forum
일시: 2006년 8월 19일
장소: 대전 유성 레전드호텔
Acute diffuse alopecia areata 외 11건 발표

2007 대한모발학회 제6차 Hair Forum
일시: 2007년 8월 18일
장소: 대전 유성 리베라 호텔
모낭유래세포의 특성분석 외 13건 발표

2008 대한모발학회 제7차 Hair Forum
일시: 2008년 8월 23일
장소: 대전 유성 리베라 호텔
전두탈모증 환자에서 모반 제거후 모발재생의 치료 경험 외 18 건 발표

2009 대한모발학회 제8차 Hair Forum
일시: 2009년 8월 22일
장소: 대전 유성 리베라 호텔
원형 탈모증 환자에서 스트레스 평가에 대한 예비 연구 외 9건 발표

2010 대한모발학회 제9차 Hair Forum
일시: 2010년 8월 21일
장소: 대전 유성 리베라 호텔
Differential expression of cytokines and interferone inducible genes in alopecia areata 외 16건 발표

2011 대한모발학회 제10차 Hair Forum
일시: 2011년 8월 27일
장소: 대전 아드리아 호텔
Retinol-binding protein 4 (RBP4) and anti-RBP4 antibody are increased in alopecia areata 외 12건 발표

2012 대한모발학회 제11차 Hair Forum
일시: 2012년 8월 18일
장소: 대전 아드리아 호텔
Effects of mycophenolic acid and rapamycin on hair growth 외 12건 발표

대한모발학회 연혁

2013 대한모발학회 제12차 Hair Forum
일시: 2013년 8월 17일
장소: 대전 아드리아 호텔
How can we enhance follicular penetration? (In vivo preliminary study) 외 13건 발표

2014 대한모발학회 제13차 Hair Forum
일시: 2014년 7월 26일
장소: 대전 유성호텔 8층
스타볼룸털껍질(hair cuticle)이 모발색조에 미치는 영향 외 6건 발표

2015 대한모발학회 제14차 Hair Forum
일시: 2015년 8월 22일
장소: 대전 유성호텔 8층 스타볼룸
Experience of combination therapy with finasteride and low dose dutasteride in the treatment of male pattern hair loss 외 8건 발표

2016 대한모발학회 제15차 Hair Forum
일시: 2016년 8월 27일
장소: 대전 유성호텔 8층 스타볼룸

2017 대한모발학회 제16차 Hair Forum
일시: 2017년 8월 26일(토)
장소: 대전 유성호텔 8층 스타볼룸

2018 대한모발학회 제17차 Hair Forum
일시: 2018년 8월 18일(토)
장소: 대전 유성호텔 8층 스타볼룸
The effect of ceramide-based essence cream for the damaged hair shaft 외 8편 발표

2019 대한모발학회 제18차 Hair Forum
일시: 2019년 8월 17일(토)
장소: 대전 유성 호텔 8층 스타볼룸
Impact of alopecia areata on subsequent pregnancy rate: a retrospective cohort study 외 10편 발표

3. 대한피부과학회 학술대회 시 모발심포지엄 개최

대한모발학회는 대한피부과학회 산하의 모발연구분과위원회이기도 하므로, 1999년부터 매년 대한피부과학회의 춘추계 학술대회에서 모발심포지엄을 진행하고 있습니다. 2009년부터는 대한피부과학회 춘추계학술대회시 한 번에 한해 분과심포지엄을 개최할 수 있는 대한피부과학회의 새로운 자체 규정에 따라 추계학술대회에서 모발심포지엄을 개최해 오고 있습니다.

전시회사

No.	회사명	연락처
1	한국오가논	1577-8582
2	GSK	02-709-4114
3	갈더마코리아	02-6717-2000
4	한국노바티스	02-768-9000
5	한국얀센	02-2094-4500
6	한국릴리	02-3459-2676
7	사노피젠자임	02-2136-9000
8	에스트라	080-023-3900
9	더유제약	02-2615-5724
10	애브비	02-3429-9300
11	HK이노엔	02-6477-0000
12	존슨앤드존슨	080-023-1414
13	종근당	02-2194-0300
14	동아ST	02-920-8286
15	동화약품	02-2021-9495
16	바름메디	02-733-2900
17	대웅제약	02-550-8800
18	동구바이오	02-2684-5421
19	네오팜	02-591-4511
20	정우의학	02-822-1361

광고회사

No.	회사명	연락처
1	한국오가논	1577-8582
2	GSK	02-709-4114
3	애브비	02-3429-9300
4	종근당	02-2194-0300
5	부광약품	02-828-8114
6	코오롱제약	080-203-6000
7	HPNC	02-553-7895
8	원더메드	031-705-8841
9	한국얀센	02-2094-4500
10	한미약품	02-410-9114
11	제이알팜	–
12	제뉴원사이언스	080-601-0090
13	한독약품	02-527-5114
14	에피바이오텍	070-4209-0556
15	닥터디퍼런트	080-766-5252