

CURRICULUM VITAE

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Career:

Internship

Kyung-Pook National University Hospital, Daegu, Korea 1997 Mar to 1998 Feb

Residency

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Fellowship

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Postdoctoral Research Associate

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Associate Professor

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Seoul National University Hospital, Seoul, Korea 2012 Apr to 2017 Aug

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Academic and Professional Positions

- 1997-1998 Intern, Kyung-Pook National University Hospital, Daegu, Korea
1998-2002 Resident, Department of Internal Medicine, Kyung-Pook National University Hospital, Daegu, Korea
2002-2004 Fellow, Division of Allergy and Clinical Immunology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea
2004-2006 Postdoctoral Research Fellow, Section of Pulmonary and Critical Care Medicine, Yale University School of Medicine, New Haven, US
2006-2009 Assistant Professor, Division of Pulmonary, Allergy, and Critical Care Medicine, Department of Internal Medicine, Hallym University, Sacred Heart Hospital, Gyeonggi-do, Korea
2008-2009 Chief, Hallym University, Sacred Heart Hospital Regional Pharmacovigilance Center, Gyeonggi-do, Korea
2009-2012 Assistant Professor, Section of Allergy and Clinical Immunology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea
2012-2017 Associate Professor, Section of Allergy and Clinical Immunology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea
2012- Chief, Seoul National University Hospital Regional Pharmacovigilance Center, Seoul, Korea
2013-2021 Chair, Drug Allergy Workgroup, Korean Academy of Asthma, Allergy and Clinical Immunology
2017- Chief Editor, Journal of Pharmacoepidemiology and Risk management
2017- Professor, Section of Allergy and Clinical Immunology, Department of Internal Medicine, Seoul National University Hospital, Seoul, Korea
2021- Chief, Drug Safety Center, Seoul National University Hospital
2021- President, Korea Drug Allergy Research Consortium (KoDARC)

Medical License and Board Certifications:

- 1997 Korean License of Medical Doctor
2002 Korean Board Certification of Internal Medicine
2004 Korean Board Certification of Allergy and Clinical Immunology

Awards

- 2008 Kunil Research Award from Korean Women's Medical Association
2009 Outstanding abstract award from Korean Academy of Asthma, Allergy, and Clinical Immunology
2010 Outstanding article awards of the year from Korean Journal of Medicine
2021 The 31st Outstanding article award from The Korean Federation of Science and Technology Societies
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Bibliography:

1. **Kang HR**, Yim EY, Oh SY, Chang YS, Kim YK, Cho SH, Min KU, Kim YY. Normal C1 inhibitor mRNA expression level in type I hereditary angioedema patients: Newly found C1 inhibitor gene mutations. *Allergy*. 2006;61:260-4.
2. Cho SJ, Kang MJ, Homer RJ, **Kang HR**, Zhang X, Lee PJ, Elias JA, Lee CG. Role of early growth response-1 (Egr-1) in interleukin-13-induced inflammation and remodeling. *J Biol Chem*. 2006;281:8161-8.
3. Lee CG, **Kang HR**, Homer RJ, Chupp G, Elias JA. Transgenic Modeling of Transforming Growth Factor β 1: Role of Apoptosis in Fibrosis and Alveolar Remodeling. *Proc Am Thorac Soc*. 2006;3:418-23.
4. **Kang HR**, Cho SJ, Lee CG, Homer RJ, Elias JA. Transforming growth factor (TGF)- β 1 stimulates pulmonary fibrosis and inflammation via a Bax-dependent, bid-activated pathway that involves matrix metalloproteinase-12. *J Biol Chem*. 2007;282:7723-32.
5. **Kang HR**, Lee CG, Homer RJ, Elias JA. Semaphorin 7A plays a critical role in TGF- β 1-induced pulmonary fibrosis. *J Exp Med*. 2007;204:1083-93.
6. Kim JH, Jang YS, Eom KS, Hwang YI, **Kang HR**, Jang SH, Kim CH, Park YB, Lee MG, Hyun IG, Jung KS, Kim DG. Transforming growth factor β 1 induces epithelial-to-mesenchymal transition of A549 cells. *J Korean Med Sci*. 2007;22:898-904.
7. Yamasaki M & **Kang HR(cofirst)**, Homer RJ, Chapoval SP, Cho SJ, Lee BJ, Elias JA, Lee CG. P21 Regulates TGF-1-Induced Pulmonary Responses via a TNF α Signaling Pathway. *Am J Respir Cell Mol Biol*. 2008;38:346-53.
8. Park S, Cho GY, Kim SG, Hwang YI, **Kang HR**, Jang SH, Kim DG, Song YR, Bae YA, Jung KS. Brain natriuretic peptide levels have diagnostic and prognostic capability for cardio-renal syndrome type 4 in intensive care unit patients. *Crit Care*. 2009;13:R70.
9. Hwang HY, Kim CH, **Kang HR**, Shin T, Park SM, Jang SH, Park YB, Kim CH, Kim DG, Lee MG, Hyun IG, Jung KS. Comparison of the Prevalence of Chronic Obstructive Pulmonary Disease Diagnosed by Lower Limit of Normal and Fixed Ratio Criteria. *J Korean Med Sci* 2009;24:621-6.
10. Kim SH, Lee SH, Lee SM, **Kang HR**, Park HW, Kim SS, Cho SH, Min KU, Kim YY, Chang YS. Outcomes of premedication for non-ionic radio-contrast media hypersensitivity reactions in Korea. *Eur J Radiol*. 2011;80:363-7.
11. Kim SH, Kim M, Lee KW, Kim SH, **Kang HR**, Park HW, Jee YK. HLA-B*5901 is strongly associated with methazolamide-induced Stevens-Johnson syndrome/toxic epidermal necrolysis. *Pharmacogenomics*. 2010;11:879-84.
12. Choi JH, Lee KW, **Kang HR**, Hwang YI, Jang S, Kim DG, Kim CH, Hyun IG, Shin TR, Park SM, Lee MG, Lee CY, Park YB, Jung KS. Clinical efficacy of direct DNA sequencing analysis on sputum specimens for early detection of drug-resistant Mycobacterium tuberculosis in a clinical setting. *Chest*. 2010;137:393-400.
13. Kang MK, Kim BK, Kim TW, Kim SH, **Kang HR**, Park HW, Chang YS, Kim SS, Min KU, Kim YY, Cho SH. Physicians' preferences for asthma guidelines implementation. *Allergy Asthma Immunol Res*. 2010;2:247-53.
14. **Kang HR**, Jee YK, Kim YS, Lee CH, Jung JW, Kim SH, Park HW, Chang YS, Chang IJ, Cho SH, Min KU, Kim SH, Lee KW. Positive and negative associations of HLA class I alleles with allopurinol-induced SCARs in Koreans. *Pharmacogenet Genomics*. 2011;21:303-7.

15. Jung JW, Song WJ, Kim YS, Joo KW, Lee KW, Kim SH, Park HW, Chang YS, Cho SH, Min JU, **Kang HR**. HLA-B58 can help the clinical decision on starting allopurinol in patients with chronic renal insufficiency. *Nephrol Dial Transplant* 2011;26:3567-72.
16. Jung JW, **Kang HR**, Ji GE, Park MS, Song WJ, Kim MH, Kwon JW, Kim TW, Park HW, Cho SH, Min KU. Therapeutic effects of fermented red ginseng in allergic rhinitis: a randomized, double-blind, placebo-controlled study. *Allergy Asthma Immunol Res*. 2011;3:103-10.
17. Jung JW, **Kang HR**, Kwon JW, Kim TE, Lee SH, Hong KS, Yu KS, Cho SH. The potential inhibitory effect of revaprazan, an acid pump antagonist, on anticoagulation with warfarin. *Tohoku J Exp Med*. 2011;224:293-300.
18. Jung JW, Kim SH, Kwon JW, Kim TW, **Kang HR**, Park HW, Kim SS, Chang YS, Cho SH, Min KU; COREA (Cohort for Reality and Evolution of adult Asthma) Research Group. Clinical characteristics and long-term outcomes related to sputum eosinophilia in Korean asthmatics. *Asia Pac Allergy*. 2011;1:16-24.
19. Kim SH, Lee KW, Song WJ, Kim SH, Jee YK, Lee SM, **Kang HR**, Park HW, Cho SH, Park SH, Min KU, Chang YS; Adverse Drug Reaction Research Group in Korea. Carbamazepine-induced severe cutaneous adverse reactions and HLA genotypes in Koreans. *Epilepsy Res*. 2011;97:190-7.
20. Lee SH, **Kang HR**, Jung JW, Kwon JW, Hong KS, Yu KS, Cho SH. Effect of oseltamivir on bleeding risk associated with warfarin therapy: a retrospective review. *Clin Drug Investig*. 2012;32:131-7.
21. Jung JW, Ju YS, **Kang HR**. Association between parental smoking behavior and children's respiratory morbidity: 5-year study in an urban city of South Korea. *Pediatr Pulmonol*. 2012;47:338-45.
22. Kwon H, Lee SH, Kim SE, Lee JH, Jee YK, **Kang HR**, Park BJ, Park JW, Hong CS. Spontaneously reported hepatic adverse drug events in Korea: multicenter study. *J Korean Med Sci*. 2012;27:268-73.
23. Kim SH, Kim TW, Kwon JW, **Kang HR**, Lee YW, Kim TB, Kim SH, Park HW, Park SW, Chang YS, Cho YS, Park JW, Cho YJ, Yoon HJ, Cho SH, Choi BW, Moon HB, Min KU. Economic costs for adult asthmatics according to severity and control status in Korean tertiary hospitals. *J Asthma*. 2012;49:303-9.
24. Jung JW, **Kang HR**, Kim MH, Lee W, Hahn MH, Cho SH. Immediate hypersensitivity reactions to gadolinium-based MR contrast media. *Radiology*. 2012;264:412-22.
25. Song WJ, Shim EJ, Kang MG, Sohn SW, **Kang HR**. Severe drug hypersensitivity induced by erdosteine and doxofylline as confirmed by patch and lymphocyte transformation tests: a case report. *J Investig Allergol Clin Immunol*. 2012;22:230-2.
26. Kim MH, Shim EJ, Jung JW, Sohn SW, **Kang HR**. A case of allopurinol-induced fixed drug eruption confirmed with a lymphocyte transformation test. *Allergy Asthma Immunol Res*. 2012;4:309-10.
27. Hong KS, Kang SJ, Choi JK, Kim JH, Seo H, Lee S, Jung JW, **Kang HR**, Cho SH, Kim JS. Gastrointestinal tuberculosis is not associated with proton pump inhibitors: A retrospective cohort study. *World J Gastroenterol*. 2013;19:258-64.
28. Kim MH, Jung JW, **Kang HR**. The usefulness of job relocation and serum eosinophil cationic protein in baker's asthma. *Int Arch Allergy Immunol*. 2013;161:252-7.
29. Jung JW, Kim JY, Cho SH, Choi BW, Min KU, **Kang HR**. Allergic rhinitis and serum 25-hydroxyvitamin D level in Korean adults. *Ann Allergy Asthma Immunol*. 2013;111:352-7.

30. Kang MG, Kim JY, Jung JW, Song WJ, Cho SH, Min KU, **Kang HR**. Lost to follow-up in asthmatics does not mean treatment failure: causes and clinical outcomes of non-adherence to outpatient treatment in adult asthma. *Allergy Asthma Immunol Res.* 2013;5(6):357-64.
31. Yang MS, Kang MG, Jung JW, Song WJ, **Kang HR**, Cho SH, Min KU. Clinical features and prognostic factors in severe cutaneous drug reactions. *Int Arch Allergy Immunol.* 2013;162(4):346-54.
32. Jung JW, **Kang HR**, Lee SH, Cho SH. The Incidence and Risk Factors of Infusion-Related Reactions to Rituximab for Treating B Cell Malignancies in a Single Tertiary Hospital. *Oncology.* 2014;86(3):127-134.
33. Park HK, Jung JW, Cho SH, Min KU, **Kang HR**. What makes a difference in exercise-induced bronchoconstriction: an 8 year retrospective analysis. *PLoS One.* 2014;9:e87155.
34. Jung JW, **Kang HR**, Kim JY, Lee SH, Kim SS, Cho SH. Are asthmatic patients prone to bone loss? *Ann Allergy Asthma Immunol.* 2014;112:426-31.
35. Kim MH, Jung JW, Cho SH, Min KU, **Kang HR**. The impact of sinusitis on the long-term clinical outcomes of asthma. *Asia Pac Allergy.* 2014;4:222-9.
36. Jung JW, Cho SH, Kim KH, Min KU, **Kang HR**. Clinical features of fixed drug eruption at a tertiary hospital in Korea. *Allergy Asthma Immunol Res.* 2014;6:415-20.
37. Kim SH, Park DE, Lee HS, **Kang HR**, Cho SH. Chronic low dose chlorine exposure aggravates allergic inflammation and airway hyperresponsiveness and activates inflammasome pathway. *PLoS One.* 2014;9(9):e106861.
38. Lee SY, Yoon SH, Song WJ, Lee SH, **Kang HR**, Kim SS, Cho SH. Influence of chronic sinusitis and nasal polyp on the lower airway of subjects without lower airway diseases. *Allergy Asthma Immunol Res.* 2014;6:310-5.
39. Sim JH, Lee HS, Lee S, Park DE, Oh K, Hwang KA, **Kang HR**, Ye SK, Kim HR. Anti-asthmatic activities of an ethanol extract of *Aster yomena* in an ovalbumin-induced murine asthma model. *J Med Food.* 2014;17(5):606-11.
40. Kim MH, Lee SY, Lee SE, Yang MS, Jung JW, Park CM, Lee W, Cho SH, **Kang HR**. Anaphylaxis to iodinated contrast media: clinical characteristics related with development of anaphylactic shock. *PLoS One.* 2014;9:e100154.
41. Jung JW, Kim JY, Yoon SS, Cho SH, Park SY, **Kang HR**. HLA-DR9 and DR14 are associated with the allopurinol-induced hypersensitivity in hematologic malignancy. *Tohoku J Exp Med.* 2014;233:95-102.
42. Jung JW, **Kang HR**, Lee HS, Park HW, Cho SH, Min KU, Sohn SW. Expression levels of eosinophil granule protein mRNAs in induced sputum reflect airway hyperresponsiveness and airflow limitation. *Tohoku J Exp Med.* 2014;233:49-56.
43. Lee SY, **Kang HR**, Song WJ, Lee KH, Han SW, Cho SH. Overcoming oxaliplatin hypersensitivity: different strategies are needed according to the severity and previous exposure. *Cancer Chemother Pharmacol.* 2014;73:1021-9.
44. Kim HJ, Kim Y, Park SJ, Bae B, **Kang HR**, Cho SH, Yoo HY, Nam JH, Kim WK, Kim SJ. Airway Smooth Muscle Sensitivity to Methacholine in Precision-Cut Lung Slices (PCLS) from Ovalbumin-induced Asthmatic Mice. *Korean J Physiol Pharmacol.* 2015;19:65-71.
45. Jung JW, Kim DK, Park HW, Oh KH, Joo KW, Kim YS, Ahn C, Lee KW, Cho SH, Min KU, **Kang HR**. An effective strategy to prevent allopurinol-induced hypersensitivity by HLA typing. *Genet Med.* 2015;17:807-14.

46. Yoon SH, Lee SY, **Kang HR**, Kim JY, Hahn S, Park CM, Chang YS, Goo JM, Cho SH. Skin tests in patients with hypersensitivity reaction to iodinated contrast media: a meta-analysis. *Allergy*. 2015;70:625-37.
47. Yang MS, Choi SI, Song WJ, Kim SH, **Kang HR**, Park HW, Cho SH, Min KU, Kim JH, Chang YS. Impact of an electronic consultant system on hypersensitivity reactions to iodinated radiocontrast media: an observational study. *Postgrad Med J*. 2015;91:193-9.
48. Lee HS, Kwon HS, Park DE, Woo YD, Kim HY, Kim HR, Cho SH, Min KU, **Kang HR**, Chang YS. Thalidomide inhibits alternative activation of macrophages in vivo and in vitro: a potential mechanism of anti-asthmatic effect of thalidomide. *PLoS One*. 2015;10:e0123094.
49. Kim SH, Lim KH, Park HK, Lee SY, Kim SH, **Kang HR**, Park HW, Chang YS, Cho SH. Reduced IRF7 response to rhinovirus unrelated with DNA methylation in peripheral mononuclear cells of adult asthmatics. *Asia Pac Allergy*. 2015;5:114-22.
50. Jung JW, Choi JC, Shin JW, Kim JY, Park IW, Choi BW, Park HW, Cho SH, Kim K, **Kang HR**. Lung Microbiome Analysis in Steroid-Naïve Asthma Patients by Using Whole Sputum. *Tuberc Respir Dis*. 2016;79:165-78.
51. Kim BK, Kim JY, Kang MK, Yang MS, Park HW, Min KU, Cho SH, **Kang HR**. Allergies are still on the rise? A 6-year nationwide population-based study in Korea. *Allergol Int*. 2016;65:186-91.
52. Jung JW, Choi YH, Park CM, Park HW, Cho SH, **Kang HR**. Outcomes of corticosteroid prophylaxis for hypersensitivity reactions to low osmolar contrast media in high-risk patients. *Ann Allergy Asthma Immunol*. 2016;117:304-309.
53. Yang MS, Lee JY, Kim J, Kim GW, Kim BK, Kim JY, Park HW, Cho SH, Min KU, **Kang HR**. Incidence of Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis: A Nationwide Population-Based Study Using National Health Insurance Database in Korea. *PLoS One*. 2016;11:e0165933.
54. Lee S, Choi J, Kim HS, Kim GJ, Lee KH, Park CH, Han J, Yoon D, Park MY, Park RW, **Kang HR**, Kim JH. Standard-based comprehensive detection of adverse drug reaction signals from nursing statements and laboratory results in electronic health records. *J Am Med Inform Assoc*. 2017;24:697-708.
55. Yang MS, Kim JY, Kim BK, Park HW, Cho SH, Min KU, **Kang HR**. True rise in anaphylaxis incidence: Epidemiologic study based on a national health insurance database. *Medicine (Baltimore)*. 2017;96:e5750.
56. Park HJ, Park JW, Yang MS, Kim MY, Kim SH, Jang GC, Nam YH, Kim GW, Kim S, Park HK, Jung JW, Park JS, **Kang HR**. Re-exposure to low osmolar iodinated contrast media in patients with prior moderate-to-severe hypersensitivity reactions: A multicentre retrospective cohort study. *Eur Radiol*. 2017;27:2886-2893.
57. Lee SY, Yang MS, Choi YH, Park CM, Park HW, Cho SH, **Kang HR**. Stratified premedication strategy for the prevention of contrast media hypersensitivity in high-risk patients. *Ann Allergy Asthma Immunol*. 2017;118:339-344.
58. Kim BK, Jung JW, Kim TB, Chang YS, Park HS, Moon J, Lee ST, Jung KH, Jung KY, Chu K, Lee SK, **Kang HR**, Park HW. HLA-A*31:01 and lamotrigine-induced severe cutaneous adverse drug reactions in a Korean population. *Ann Allergy Asthma Immunol*. 2017;118:629-630.
59. Park HK, Kang MG, Yang MS, Jung JW, Cho SH, **Kang HR**. Epidemiology of drug-induced anaphylaxis in a tertiary hospital in Korea. *Allergol Int*. 2017; 66:557-562.

60. Kang SY, Park DE, Song WJ, Bae BR, Lee JW, Sohn KH, Lee HS, **Kang HR**, Park HW, Chang YS, Choi SJ, Oh WI, Min KU, Cho SH. Immunologic regulatory effects of human umbilical cord blood-derived mesenchymal stem cells in a murine ovalbumin asthma model. *Clin Exp Allergy*. 2017;47:937-945.
61. Lee JS, Seo H, Im K, Park SN, Kim SM, Lee EK, Kim JA, Lee JH, Kwon S, Kim M, Koh I, Hwang S, Park HW, **Kang HR**, Park KS, Kim JH, Lee DS. Idiopathic hypereosinophilia is clonal disorder? Clonality identified by targeted sequencing. *PLoS One*. 2017;12:e0185602.
62. Chang Y, Kang SY, Kim J, **Kang HR**, Kim HY. Functional Defects in Type 3 Innate Lymphoid Cells and Classical Monocytes in a Patient with Hyper-IgE Syndrome. *Immune Netw* 2017;17:352-364.
63. Yang MS, Kim JY, Kang MG, Lee SY, Jung JW, Cho SH, Min KU, **Kang HR**. Direct costs of severe cutaneous adverse reactions in a tertiary hospital in Korea. *Korean J Intern Med*. 2019;34(1):195-201.
64. Kim S, Nam Jin K, Cho SH, Hyun Lee C, **Kang HR**. Severe Asthma Phenotypes Classified by Site of Airway Involvement and Remodeling via Chest CT Scan. *J Investig Allergol Clin Immunol*. 2018;28(5):312-320.
65. Kim YS, Choi YH, Cho YJ, Lee S, Yoon SH, Park CM, **Kang HR**. Incidence of Breakthrough Reaction in Patients with Prior Acute Allergic-Like Reactions to Iodinated Contrast Media according to the Administration Route. *Korean J Radiol*. 2018;19:352-357.
66. Chung SJ, Kang SY, Kang RY, Kim YC, Lee KH, Kim TY, Han SW, **Kang HR**. A new non-dilution rapid desensitization protocol successfully applied to all-grade platinum hypersensitivity. *Cancer Chemother Pharmacol*. 2018;82(5):777-785.
67. Jung JW, Kim JY, Park IW, Choi BW, **Kang HR**. Genetic markers of severe cutaneous adverse reactions. *Korean J Intern Med*. 2018;33(5):867-875.
68. Park SJ, Kang DY, Sohn KH, Yoon SH, Lee W, Choi YH, Cho SH, **Kang HR**. Immediate Mild Reactions to CT with Iodinated Contrast Media: Strategy of Contrast Media Readministration without Corticosteroids. *Radiology*. 2018;288(3):710-716.
69. Jung JW, Suh DI, Park HJ, Kim S, Kwon HS, Yang MS, Park CS, Kim JH, Kim SH, Lee YW, Hur GY, Ye YM, Kwon YE, Park HK, Kim CW, Koh YI, Park JW, Lee JM, Min KU, Wickner P, **Kang HR**. Clinical Features of Hereditary Angioedema in Korean Patients: A Nationwide Multicenter Study. *Int Arch Allergy Immunol*. 2018;176(3-4):272-279.
70. Yang MS, Kang DY, Seo B, Park HJ, Park SY, Kim MY, Park KH, Koo SM, Nam YH, Kim S, Jung JW, Kim TB, Jang GC, Yang HJ, Ahn YM, Park JW, **Kang HR**; Drug Allergy Work Group of KAAACI. Incidence of cephalosporin-induced anaphylaxis and clinical efficacy of screening intradermal tests with cephalosporins: A large multicenter retrospective cohort study. *Allergy*. 2018;73(9):1833-1841.
71. Woo YD, Koh J, **Kang HR**, Kim HY, Chung DH. The invariant natural killer T cell-mediated chemokine X-C motif chemokine ligand 1-X-C motif chemokine receptor 1 axis promotes allergic airway hyperresponsiveness by recruiting CD103(+) dendritic cells. *J Allergy Clin Immunol*. 2018;142(6):1781-1792.e12.
72. Sohn KH, Kang DY, Kim JY, Lee SY, Lee KH, Han SW, **Kang HR**. Incidence and Risk of Oxaliplatin-Induced Hypersensitivity in Patients with Asymptomatic Prior Exposure: A Prospective Observational Study. *J Allergy Clin Immunol Pract*. 2018;6(5):1642-1648.e2.

73. Kim TH, Yoon SH, Lee SY, Choi YH, Park CM, **Kang HR**, Cho SH. Biphasic and protracted anaphylaxis to iodinated contrast media. *Eur Radiol.* 2018;28(3):1242-1252.
74. Kim J, Chang Y, Bae B, Sohn KH, Cho SH, Chung DH, **Kang HR**, Kim HY. Innate immune crosstalk in asthmatic airways: innate lymphoid cells coordinate the polarization of lung macrophage. *J Allergy Clin Immunol.* 2019;143(5):1769-1782.
75. Sohn KH, Kim GW, Lee SY, Kim HS, Cho SH, Han JK, **Kang HR**. Immediate and delayed hypersensitivity after intra-arterial injection of iodinated contrast media: a prospective study in patients with coronary angiography. *Eur Radiol.* 2019;29(10):5314-5321.
76. Kang MG, Sohn KH, Kang DY, Park HK, Yang MS, Lee JY, **Kang HR**. Analysis of Individual Case Safety Reports of Severe Cutaneous Adverse Reactions in Korea. *Yonsei Med J.* 2019;60(2):208-215.
77. Oh HL, Kang DY, **Kang HR**, Kim S, Koh YI, Kim SH, Kim MH, Suh DI; Korean Severe Cutaneous Adverse Reactions Consortium. Severe Cutaneous Adverse Reactions in Korean Pediatric Patients: A Study From the Korea SCAR Registry. *Allergy Asthma Immunol Res.* 2019;11(2):241-253.
78. Lee SY, Nam YH, Koh YI, Kim SH, Kim S, **Kang HR**, Kim MH, Lee JG, Park JW, Park HK, La HO, Kim MY, Park SJ, Kwon YE, Jung JW, Kim SH, Kim CW, Yang MS, Kang MG, Lee JY, Kim JH, Kim SH, Hur GY, Jee YK, Jin HJ, Park CS, Jeong YY, Ye YM. Phenotypes of Severe Cutaneous Adverse Reactions Caused by Nonsteroidal Anti-inflammatory Drugs. *Allergy Asthma Immunol Res.* 2019;11(2):212-221.
79. Han S, Yoon SH, Lee W, Choi YH, Kang DY, **Kang HR**. Management of Adverse Reactions to Iodinated Contrast Media for Computed Tomography in Korean Referral Hospitals: A Survey Investigation. *Korean J Radiol.* 2019;20(1):148-157.
80. Shim JS, Yun J, Kim MY, Chung SJ, Oh JH, Kang DY, Jung JW, Cho SH, **Kang HR**. The Presence of HLA-B*75, DR13 Homozygosity, or DR14 Additionally Increases the Risk of Allopurinol-Induced Severe Cutaneous Adverse Reactions in HLA-B*58:01 Carriers. *J Allergy Clin Immunol Pract.* 2019;7(4):1261-1270.
81. Kim MH, Kim SH, Park SY, Ban GY, Kim JH, Jung JW, Moon JY, Song WJ, Kwon HS, Kwon JW, Lee JH, **Kang HR**, Park JS, Kim TB, Park HW, Yoo KH, Oh YM, Koh YI, Jang AS, Lee BJ, Cho YJ, Cho SH, Park HS, Park CS, Yoon HJ, Cho YS. Characteristics of Adult Severe Refractory Asthma in Korea Analyzed From the Severe Asthma Registry. *Allergy Asthma Immunol Res.* 2019;11(1):43-54
82. Suh YJ, Yoon SH, Hong H, Hahn S, Kang DY, **Kang HR**, Choi YH, Lee W. Acute Adverse Reactions to Nonionic Iodinated Contrast Media: A Meta-Analysis. *Invest Radiol.* 2019;54(9):589-599.
83. Ryoo CH, Choi YH, Cheon JE, Yoon SH, **Kang HR**, Park SJ, Lee W. Preventive Effect of Changing Contrast Media in Patients With A Prior Mild Immediate Hypersensitivity Reaction to Gadolinium-Based Contrast Agent. *Invest Radiol.* 2019;54(10):633-637.
84. Sim DW, Yu JE, Jeong J, Jung JW, **Kang HR**, Kang DY, Ye YM, Jee YK, Kim S, Park JW, Kang MG, Kim SH, Park HK, Yang MS, Hur GY, Lee JK, Choi JH, Kwon YE, Koh YI; Korean Severe Cutaneous Adverse Reactions Consortium. Variation of clinical manifestations according to culprit drugs in DRESS syndrome. *Pharmacoepidemiol Drug Saf.* 2019;28(6):840-848.
85. Kim S, Yun J, Kang DY, Park HJ, Jo EJ, Jung JW, Park HK, Park JW, Jee YK, **Kang HR**, Lee JM. Carbonic anhydrase inhibitor-induced Stevens-Johnson syndrome/toxic

- epidermal necrolysis leads to extensive cutaneous involvement. *J Allergy Clin Immunol Pract.* 2019;7(8):2851-2853.e2.
86. Park HJ, Yun J, Kang DY, Park JW, Koh YI, Kim S, Kim SH, Nam YH, Jeong YY, Kim CW, Park HK, Kim SH, **Kang HR**, Jung JW; Drug Allergy Work Group of KAAACI. Unique Clinical Characteristics and Prognosis of Allopurinol-Induced Severe Cutaneous Adverse Reactions. *J Allergy Clin Immunol Pract.* 2019;7(8):2739-2749.e3.
 87. Park CS, Kang DY, Kang MG, Kim S, Ye YM, Kim SH, Park HK, Park JW, Nam YH, Yang MS, Jee YK, Jung JW, Kim SH, Kim CW, Kim MY, Kim JH, Lee J, Lee JG, Kim SH, La HO, Kim MH, Park SJ, Koh YI, Lee SM, Kwon YE, Jin HJ, Kim HK, **Kang HR**, Choi JH; Korean Registry of Severe Cutaneous Adverse Reactions Consortium. Severe Cutaneous Adverse Reactions to Antiepileptic Drugs: A Nationwide Registry-Based Study in Korea. *Allergy Asthma Immunol Res.* 2019;11(5):709-722.
 88. Shim JS, Lee HS, Park DE, Won Lee J, Bae B, Chang Y, Kim J, Kim HY, **Kang HR**. Aggravation of asthmatic inflammation by chlorine exposure via innate lymphoid cells and CD11c^{intermediate} macrophages. *Allergy.* 2020;75(2):381-391.
 89. Cha MJ, Kang DY, Lee W, Yoon SH, Choi YH, Byun JS, Lee J, Kim YH, Choo KS, Cho BS, Jeon KN, Jung JW, **Kang HR**. Hypersensitivity Reactions to Iodinated Contrast Media: A Multicenter Study of 196 081 Patients. *Radiology.* 2019;293(1):117-124.
 90. Yang MS, Lee JY, Kim J, Kim GW, Kim BK, Kim JY, Park HW, Cho SH, Min KU, **Kang HR**. Searching for the Culprit Drugs for Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis from a Nationwide Claim Database in Korea. *J Allergy Clin Immunol Pract.* 2020;8(2):690-695.e2.
 91. Lee JH, Moon M, Kim YC, Chung SJ, Oh J, Kang DY, Lee SY, Lee KH, Yun J, **Kang HR**. A One-Bag Rapid Desensitization Protocol for Paclitaxel Hypersensitivity: A Noninferior Alternative to a Multi-Bag Rapid Desensitization Protocol. *J Allergy Clin Immunol Pract.* 2020;8(2):696-703.
 92. Chung SJ, Kang DY, Lee W, Lee SB, Kim S, Lee SE, Sim DW, Kang MG, Park KH, Jung JW, Yun J, **Kang HR**. HLA-DRB1*15: 02 Is Associated With Iodinated Contrast Media-Related Anaphylaxis. *Invest Radiol.* 2020;55(5):304-309.
 93. Kang SY, Kim J, Ham J, Cho SH, **Kang HR**, Kim HY. Altered T cell and monocyte subsets in prolonged immune reconstitution inflammatory syndrome related with DRESS (drug reaction with eosinophilia and systemic symptoms). *Asia Pac Allergy.* 2020;10(1):e2.
 94. Thong BY, Lucas M, **Kang HR**, Chang YS, Li PH, Tang MM, Yun J, Fok JS, Kim BK, Nagao M, Rengganis I, Tsai YG, Chung WH, Yamaguchi M, Rerkpattanapipat T, Kamchaisatian W, Leung TF, Yoon HJ, Zhang L, Latiff AHA, Fujisawa T, Thien F, Castells MC, Demoly P, Wang JY, Pawankar R. Drug hypersensitivity reactions in Asia: regional issues and challenges. *Asia Pac Allergy.* 2020;10(1):e8.
 95. Tang MM, Fok JS, Thong BY, Yun J, Li PH, **Kang HR**, Thien F, Yamaguchi M, Lucas M, Chang YS, Kim BK, Nagao M, Rengganis I, Tsai YG, Chung WH, Rerkpattanapipat T, Kamchaisatian W, Leung TF, Ho JY, Zhang L, Latiff AHA, Fujisawa T, Castells MC, Demoly P, Wang JY, Pawankar R. Diagnostic procedures & practices in drug allergy/hypersensitivity: a survey of 13 Asian countries. *Asia Pac Allergy.* 2020;10(4):e36.
 96. Lee SE, Lee SY, Bae BR, Lee HS, **Kang HR**. A case of anaphylaxis after ingestion of *Liparis tanakae*. *Asia Pac Allergy.* 2020;10(4):e42.

97. Lee Y, Chang HY, Kim SH, Yang MS, Koh YI, **Kang HR**, Choi JH, Kim CW, Park HK, Kim JH, Nam YH, Kim TB, Hur GY, Jung JW, Park KH, Kim MA, Kim J, Yoon J, Ye YM. A Prospective Observation of Psychological Distress in Patients With Anaphylaxis. *Allergy Asthma Immunol Res.* 2020;12(3):496-506.
98. Maurer M, Aberer W, Agondi R, Al-Ahmad M, Al-Nesf MA, Ansotegui I, Arnaout R, Arruda LK, Asero R, Aygören-Pürsün E, Banerji A, Bauer A, Ben-Shoshan M, Berardi A, Bernstein JA, Betschel S, Bindslev-Jensen C, Bizjak M, Boccon-Gibod I, Bork K, Bouillet L, Boysen HB, Brodski N, Broesby-Olsen S, Busse P, Buttgerit T, Bygum A, Caballero T, Campos RA, Cancian M, Cherrez-Ojeda I, Cohn DM, Costa C, Craig T, Criado PR, Criado RF, Csuka D, Dissemond J, Du-Thanh A, Ensina LF, Ertaş R, Fabiani JE, Fantini C, Farkas H, Ferrucci SM, Figueras-Nart I, Fili NL, Fomina D, Fukunaga A, Gelincik A, Giménez-Arnau A, Godse K, Gompels M, Gonçalves M, Gotua M, Gower R, Grumach AS, Guidos-Fogelbach G, Hide M, Ilina N, Inomata N, Jakob T, Josviack DO, **Kang HR**, Kaplan A, Kasperska-Zajac A, Katelaris C, Kessel A, Kleinheinz A, Kocatürk E, Košnik M, Krasowska D, Kulthanan K, Kumaran MS, Larco Sousa JI, Longhurst HJ, Lumry W, MacGinnitie A, Magerl M, Makris MP, Malbrán A, Marsland A, Martinez-Saguer I, Medina IV, Meshkova R, Metz M, Nasr I, Nicolay J, Nishigori C, Ohsawa I, Özyurt K, Papadopoulos NG, Parisi CAS, Peter JG, Pfütznner W, Popov T, Prior N, Ramon GD, Reich A, Reshef A, Riedl MA, Ritchie B, Röckmann-Helmbach H, Rudenko M, Salman A, Sanchez-Borges M, Schmid-Grendelmeier P, Serpa FS, Serra-Baldrich E, Sheikh FR, Smith W, Soria A, Staubach P, Steiner UC, Stobiecki M, Sussman G, Tagka A, Thomsen SF, Treudler R, Valle S, van Doorn M, Varga L, Vázquez DO, Wagner N, Wang L, Weber-Chrysochoou C, Ye YM, Zalewska-Janowska A, Zanichelli A, Zhao Z, Zhi Y, Zuberbier T, Zwiener RD, Castaldo A. Definition, aims, and implementation of GA²LEN/HAEi Angioedema Centers of Reference and Excellence. *Allergy.* 2020;75(8):2115-2123.
99. Kim J, Kim YC, Ham J, Sohn KH, Lee SY, Chung DH, Cho SH, **Kang HR**, Kim HY. The effect of air pollutants on airway innate immune cells in patients with asthma. *Allergy.* 2020;75(9):2372-2376.
100. Kim KW, Chung S, Lee SY, Yoon SS, **Kang HR**. Successful infusion of obinutuzumab by desensitization: A case of anaphylactic shock during desensitization. *J Investig Allergol Clin Immunol.* 2020;30(6):457-459.
101. Kang MG, Han SW, **Kang HR**, Hong SJ, Kim DH, Choi JH. Probiotic NVP-1703 Alleviates Allergic Rhinitis by Inducing IL-10 Expression: A Four-week Clinical Trial. *Nutrients.* 2020;12(5):1427.
102. Sohn KH, Ham J, Chung SJ, **Kang HR**, Kim HY. Analysis of Innate and Adaptive Immunological Characteristics in Patients with IgG4-Related Disease. *Int Arch Allergy Immunol.* 2020;181(10):807-812.
103. Kim JH, Park HS, Ye YM, Shin YS, **Kang HR**, Chung SJ, Choi JH. Omalizumab Treatment in Patients With Cholinergic Urticaria: A Real-World Retrospective Study in Korea. *Allergy Asthma Immunol Res.* 2020;12(5):894-896.
104. Park SJ, Lee SY, Yoon SH, Choi YH, **Kang HR**. Corticosteroid prophylaxis may be not required for patients with mild hypersensitivity reaction to low-osmolar contrast media. *Eur J Radiol.* 2020;130:109152.
105. Park HJ, Park JW, Kim SH, Choi SY, Kim HK, Jung CG, Yang MS, Kang DY, Cho MK, Kwon HS, **Kang HR**, Lee YW; Allergy Work Group of KAAACI. The HLA-B*13:01

- and the dapsone hypersensitivity syndrome in Korean and Asian populations: genotype- and meta-analyses. *Expert Opin Drug Saf.* 2020;19(10):1349-1356.
106. Song HB, Lee D, Jin Y, Kang J, Cho SH, Park MS, Park JH, Song WJ, **Kang HR**, Lee SH, Hong ST, Choi MH. Prevalence of Toxocariasis and Its Risk Factors in Patients with Eosinophilia in Korea. *Korean J Parasitol.* 2020;58(4):413-419.
 107. Sohn KH, Baek MG, Choi SM, Bae B, Kim RY, Kim YC, Kim HY, Yi H, **Kang HR**. Alteration of lung and gut microbiota in IL-13-transgenic mice simulating chronic asthma. *J Microbiol Biotechnol.* 2020;30(12):1819-1826.
 108. Kang DY, Yun J, Lee SY, Koh YI, Sim DW, Kim S, Nam YH, Park JW, Kim SH, Ye YM, Park HK, Kim MH, Jee YK, Jung JW, Yang MS, Kim SH, Lee JK, Kim CW, Hur GY, Kim MY, Park SJ, Kwon YE, Choi JH, Kim JH, Kim SH, La HO, Kang MG, Park CS, Lee SM, Jeong YY, Kim HK, Jin HJ, Jeong JW, Lee J, Lee YW, Lee SE, Kim MS, **Kang HR**; Korean Severe Cutaneous Adverse Reactions Consortium. A Nationwide Study of Severe Cutaneous Adverse Reactions Based on the Multicenter Registry in Korea. *J Allergy Clin Immunol Pract.* 2021;9(2):929-36.
 109. Torres MJ, Trautmann A, Böhm I, Scherer K, Barbaud A, Bavbek S, Bonadonna P, Cernadas J, Chiriac A, Gaeta F, Gimenez-Arnau AM, **Kang HR**, Moreno E, Brockow K. Practice Parameters for Diagnosing and Managing Iodinated Contrast Media Hypersensitivity. 2021;76(5):1325-1339.
 110. Jin HJ, Kang DY, Nam YH, Ye YM, Koh YI, Hur GY, Kim SH, Yang MS, Kim S, Jeong YY, Kim MH, Choi JH, **Kang HR**, Jo EJ, Park HK; Korean Severe Cutaneous Adverse Reactions Consortium (KoSCAR). Severe Cutaneous Adverse Reactions to Anti-tuberculosis Drugs in Korean Patients. *Allergy Asthma Immunol Res.* 2021;13(2):245-255.
 111. Sohn KH, Seo JH, Kang DY, Lee SY, **Kang HR**. Finding the Optimal Alternative for Immediate Hypersensitivity to Low-Osmolar Iodinated Contrast. *Invest Radiol.* 2021;56(8):480-485.
 112. Sohn KH, Kim SH, **Kang HR**. Cross-Reactivity Between Carbonic Anhydrase Inhibitor Confirmed by Lymphocyte Transformation Test: A Case of Methazolamide-Induced Toxic Epidermal Necrolysis. *J Investig Allergol Clin Immunol.* 2021;31(5):455-456.
 113. Benzon HT, Maus TP, **Kang HR**, Provenzano DA, Bhatia A, Diehn F, Nelson A, McCormick ZL, Liu BP, de Andres Ares J, Anitescu M, Blackham K, Bhaskar A, Brill S, Collins J, Gulve A, Hurley RW, Jeon YH, Moon JY, Rauck RL, Rodes M, Lee RK, Shah V, Shanthanna H, van Zundert J, Huntoon M, Rathmell JP, Borges MS, Cohen SP, Greenberger PA. The Use of Contrast Agents in Interventional Pain Procedures: A Multispecialty and Multisociety Practice Advisory on Nephrogenic Systemic Fibrosis, Gadolinium Deposition in the Brain, Encephalopathy After Unintentional Intrathecal Gadolinium Injection, and Hypersensitivity Reactions. *Anesth Analg.* 2021;133(2):535-552.
 114. Choi S, Sohn KH, Jung JW, Kang MG, Yang MS, Kim S, Choi JH, Cho SH, **Kang HR**, Yi H. Lung virome: New potential biomarkers for asthma severity and exacerbation. *J Allergy Clin Immunol.* 2021;148(4):1007-1015.e9
 115. Cho SW, Kim DY, Choi S, Won S, **Kang HR**, Yi H. Microbiome profiling of uncinate tissue and nasal polyps in patients with chronic rhinosinusitis using swab and tissue biopsy. *PLoS One.* 2021;16(4):e0249688.
 116. Oh JH, Yun J, Yang MS, Kim JH, Kim SH, Kim S, Choi JH, Yim JJ, **Kang HR**. Reintroduction of Antituberculous Drugs in Patients with Antituberculous Drug-Related

- Drug Reaction with Eosinophilia and Systemic Symptoms. *J Allergy Clin Immunol Pract.* 2021;9(9):3442-3449.e3.
117. Lee HS, Park DE, Bae B, Oh K, Jung JW, Lee DS, Kim IG, Cho SH, **Kang HR**. Transglutaminase 2 contributes to the asthmatic inflammation by modulating activation of alveolar macrophages. *Immun Inflamm Dis.* 2021;9(3):871-882.
 118. Jang Y, Moon J, Kim N, Kim TJ, Jun JS, Shin YW, Chang H, **Kang HR**, Lee ST, Jung KH, Park KI, Jung KY, Chu K, Lee SK. A new rapid titration protocol for lamotrigine that reduces the risk of skin rash. *Epilepsia Open.* 2021;6(2):394-401.
 119. Shin JW, Ryu S, Ham J, Jung K, Lee S, Chung DH, **Kang HR**, Kim HY. Mesenchymal Stem Cells Suppress Severe Asthma by Directly Regulating Th2 Cells and Type 2 Innate Lymphoid Cells. *Mol Cells.* 2021;44(8):580-590.
 120. Jung JW, Oh JS, Bae B, Ahn YH, Kim LW, Choi J, Kim HY, **Kang HR**, Lee CH. Ultra-high-resolution computed tomography shows changes in the lungs related with airway hyperresponsiveness in a murine asthma model. *Sci Rep.* 2021;11(1):17584.
 121. Ham J, Kim J, Choi S, Park J, Baek MG, Kim YC, Sohn KH, Cho SH, Yang S, Bae YS, Chung DH, Won S, Yi H, **Kang HR**, Kim HY. Interactions between NCR⁺ILC3s and the Microbiome in the Airways Shape Asthma Severity. *Immune Netw.* 2021;21(4):e25.
 122. Park CS, Yang MS, Kang DY, Park HJ, Park SY, Nam YH, Kim S, Jung JW, Park HK, **Kang HR**; Drug Allergy Work Group of KAAACI. Risk factors of beta-lactam anaphylaxis in Korea: A 6-year multicenter retrospective adult case-control study. *World Allergy Organ J.* 2021;14(9):100580.
 123. Kim J, Shin JW, Lee HJ, Kim JH, Choi SM, Lee CH, **Kang HR**, Park SH, Bae YS, Chung DH, Kim HY. Serum amyloid A promotes emphysema by triggering the reciprocal activation of neutrophils and ILC3s. *Clin Transl Med.* 2021;11(12): e637.
 124. Kim YC, Kim J, Kim S, Bae B, Kim RL, Jeong EM, Cho SH, **Kang HR**. Transglutaminase 2 mediates lung inflammation and remodeling by transforming growth factor beta 1 via alveolar macrophage modulation. *Exp Lung Res.* 2021;47(10):465-475.
 125. Kang SY, Seo J, **Kang HR**. Desensitization for the prevention of drug hypersensitivity reactions. *Korean J Intern Med.* 2022;37(2):261-270.
 126. Lee KH, Kang DY, Kim HH, Kim YJ, Kim HJ, Kim JH, Song EY, Yun J, **Kang HR**. Reducing severe cutaneous adverse and type B adverse drug reactions using pre-stored human leukocyte antigen genotypes. *Clin Transl Allergy.* 2022;12(1): e12098.
 127. Maurer M, Magerl M, Betschel S, Aberer W, Ansotegui IJ, Aygören-Pürsün E, Banerji A, Bara NA, Boccon-Gibod I, Bork K, Bouillet L, Boysen HB, Brodzki N, Busse PJ, Bygum A, Caballero T, Cancian M, Castaldo A, Cohn DM, Csuka D, Farkas H, Gompels M, Gower R, Grumach AS, Guidos-Fogelbach G, Hide M, **Kang HR**, Kaplan AP, Katelaris C, Kiani-Alikhan S, Lei WT, Lockey R, Longhurst H, Lumry WB, MacGinnitie A, Malbran A, Martinez Sague I, Matta JJ, Nast A, Nguyen D, Nieto-Martinez SA, Pawankar R, Peter J, Porebski G, Prior N, Reshef A, Riedl M, Ritchie B, Rafique Sheikh F, Smith WR, Spaeth PJ, Stobiecki M, Toubi E, Varga LA, Weller K, Zanichelli A, Zhi Y, Zuraw B, Craig T. The international WAO/EAACI guideline for the management of hereditary angioedema-The 2021 revision and update. *Allergy.* 2022;77(7):1961-1990.
 128. Kang DY, Lee SY, Ahn YH, Yoon SH, Choi YH, Lee W, **Kang HR**. Incidence and risk factors of late adverse reactions to low-osmolar contrast media: A prospective observational study of 10,540 exposures. *Eur J Radiol.* 2022;146:110101.

129. Kim YC, Choi S, Sohn KH, Bang JY, Kim Y, Jung JW, Kim HY, Park J, Kim K, Kang MG, Yang MS, Kim S, Kim SH, Choi JH, Park HJ, Lee SM, Kim SH, Park JW, Lee JM, Cho SH, Won S, Yi H, **Kang HR**. *Selenomonas*: A marker of asthma severity with the potential therapeutic effect. *Allergy*. 2022;77(1):317-320.
130. Kang H, Bang JY, Mo Y, Shin JW, Bae B, Cho SH, Kim HY, **Kang HR**. Effect of *Acinetobacter lwoffii* on the modulation of macrophage activation and asthmatic inflammation. *Clin Exp Allergy*. 2022;52(4):518-529.
131. Shin JW, Kim J, Ham S, Choi SM, Lee CH, Lee JC, Kim JH, Cho SH, **Kang HR**, Kim YM, Chung DH, Chung Y, Bae YS, Bae YS, Roh TY, Kim T, Kim HY. A unique population of neutrophils generated by air pollutant-induced lung damage exacerbates airway inflammation. *J Allergy Clin Immunol*. 2022 Apr;149(4):1253-1269.e8.
132. Ahn YH, Kang DY, Park SB, Kim HH, Kim HJ, Park GY, Yoon SH, Choi YH, Lee SY, **Kang HR**. Allergic-like Hypersensitivity Reactions to Gadolinium-based Contrast Agents: An 8-year Cohort Study of 154 539 Patients. *Radiology*. 2022;303(2):329-336.
133. Lee JW, Lee SR, Kim MJ, Cho S, Youn SW, Yang MS, Kim SH, **Kang HR**, Kwon O. Skin manifestations and clinical features of drug reaction with eosinophilia and systemic symptoms (DRESS): A retrospective multicenter study of 125 patients. *J Eur Acad Dermatol Venereol*. 2022;36(9):1584-1592.
134. Ahn KM, Ahn YH, Cho MK, Kang DY, Lee SY, **Kang HR**. Validation of Practical Pathway in Patients with Anaphylaxis to Low Osmolar Contrast Media: A Retrospective Cohort Study. *J Allergy Clin Immunol Pract*. 2022 Apr 9;S2213-2198(22)00342-7.
135. **Kang HR**, Jeong J, Brockow K. Diagnosis and Prevention of Hypersensitivity Reactions to Iodinated Contrast Media. *Allergy Asthma Immunol Res*. 2022;14(4):348-360.
136. Ham J, Kim J, Sohn KH, Park IW, Choi BW, Chung DH, Cho SH, **Kang HR**, Jung JW, Kim HY. Cigarette smoke aggravates asthma by inducing memory-like type 3 innate lymphoid cells. *Nat Commun*. 2022;13(1):3852.
137. Jeong HS, Chun BC, Kang DY, **Kang HR**. Epidemiology and evaluation of adverse drug reactions in a Korean hospital database for spontaneous reports in the period 2009 to 2018. *Int J Clin Pharmacol Ther*. 2022;60(7):291-298.
138. Kim HH, Seo J, Ahn YH, Kim H, Yoon JE, Suh JH, Kang DY, Lee SY, **Kang HR**. Analysis of Breakthrough Reactions in 1,143 Desensitization Procedures in a Single Tertiary Hospital Using a One-Bag Desensitization Protocol. *Front Allergy*. 2022;3:786822.
139. Kim S, Choi S, Kim T, Jin KN, Cho SH, Lee CH, Kang HR. Phenotypic clusters on computed tomography reflects asthma heterogeneity and severity. *World Allergy Organ J*. 2022;15(2):100628.
140. Lee HW, Baek MG, Choi S, Ahn YH, Bang JY, Sohn KH, Kang MG, Jung JW, Choi JH, Cho SH, Yi H, Kang HR. Peripheral blood transcriptomic clusters uncovered immune phenotypes of asthma. *Respir Res*. 2022;23(1):237.
141. Mo Y, Kang H, Bang JY, Shin JW, Kim HY, Cho SH, Kang HR. Intratracheal administration of mesenchymal stem cells modulates lung macrophage polarization and exerts anti-asthmatic effects. *Sci Rep*. 2022;12(1):11728.
142. Kim RL, Bang JY, Kim J, Mo Y, Kim Y, Lee CG, Elias JA, Kim HY, Kang HR. Mesenchymal stem cells exert their anti-asthmatic effects through macrophage modulation in a murine chronic asthma model. *Sci Rep*. 2022;12(1):9811.