NIH-FDA IIG NEWSLETTER

National Institutes of Health // Food and Drug Administration // Immunology Interest Group

JULY 2021

PUBLICATIONS

Activating Mucosal-Associated Invariant T Cells Induces a Broad Antitumor Response.

Ruf B, Catania VV, Wabitsch S, Ma C, Diggs LP, Zhang Q, Heinrich B, Subramanyam V, Cui LL, Pouzolles M, Evans CN, Chari R, Sakai S, Oh S, Barry CE III, Barber DL, Greten TF.Cancer Immunol Res. 2021 Jun 30. doi: 10.1158/2326-6066.CIR-20-0925. Online ahead of print.PMID: 34193462

Increasing evidence suggests that Mucosal-Associated Invariant T cells (MAITs) cells are important players in cancer immunology. This study shows that MAIT cells stimulated and expanded in vivo can orchestrate a potent anti-tumor response in murine models suggesting these cells as attractive novel targets for cancer immunotherapy.

Therapeutic B-cell depletion reverses progression of Alzheimer's disease.

Kim K, Wang X, Ragonnaud E, Bodogai M, Illouz T, DeLuca M, McDevitt RA, Gusev F, Okun E, Rogaev E, Biragyn A.Nat Commun. 2021 Apr 12;12(1):2185. doi: 10.1038/s41467-021-22479-4.PMID: 33846335 Free PMC article.

For the first time the onset of Alzheimer's disease (AD) in three difference AD model mice to brain-infiltrating pathogenic B cells. Transient depletion of peripheral B cells ameliorates AD.

New insights into TCR -selection.

Dutta A, Zhao B, Love PE.Trends Immunol. 2021 Aug;42(8):735-750. doi: 10.1016/j.it.2021.06.005. Epub 2021 Jul 12.PMID: 34261578 Review

T cell receptor -selection is a pivotal checkpoint in T cell development when immature CD4-CD8- T-cells (thymocytes) express pre-TCR following successful Tcrb gene rearrangement. In this review, we discuss recent mechanistic findings that have enabled a more detailed decoding of the molecular dynamics of the -selection checkpoint and have helped to elucidate its role in early T cell development.

A local regulatory T cell feedback circuit maintains immune homeostasis by pruning self-activated T cells.

Wong HS, Park K, Gola A, Baptista AP, Miller CH, Deep D, Lou M, Boyd LF, Rudensky AY, Savage PA, Altan-Bonnet G, Tsang JS, Germain RN.Cell. 2021 Jul 22;184(15):3981-3997.e22. doi: 10.1016/j.cell.2021.05.028. Epub 2021 Jun 21.PMID: 34157301

A combination of imaging and modeling approaches identifies a paracrine feedback mechanism that enables regulatory T cells to eliminate highly self-reactive T cells, thereby dampening autoimmunity.

Role of the multifunctional transcription factor TFII-I in DNA damage repair.

Roy AL.DNA Repair (Amst). 2021 Jul 13;106:103175. doi: 10.1016/j.dnarep.2021.103175. Online ahead of print.PMID: 34280590

This review brings together recently published results highlighting the role of a multifunctional transcription factor, TFII-I/GTF2I, in DNA damage and repair.

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Endogenous retroviruses promote homeostatic and inflammatory responses to the microbiota.

Lima-Junior DS, Krishnamurthy SR, Bouladoux N, Collins N, Han SJ, Chen EY, Constantinides MG, Link VM, Lim AI, Enamorado M, Cataisson C, Gil L, Rao I, Farley TK, Koroleva G, Attig J, Yuspa SH, Fischbach MA, Kassiotis G, Belkaid Y.Cell. 2021 Jul 8;184(14):3794-3811.e19. doi: 10.1016/j.cell.2021.05.020. Epub 2021 Jun 23.PMID: 34166614 Free article.

Barrier tissues are colonized by diverse communities of commensal bacteria, which play a key role in the education of local immune responses and induction of commensal-specific immunity. This work revealed an unexpected role for endogenous retroelements in the control of commensal-induced T cells response in the skin, resulting in a multikingdom dialog that controls both tissue homeostasis and inflammation.

Universal influenza vaccine based on conserved antigens provides long-term durability of immune responses and durable broad protection against diverse challenge virus strains in mice.

Lo CY, Misplon JA, Li X, Price GE, Ye Z, Epstein SL.Vaccine. 2021 Jul 30;39(33):4628-4640. doi: 10.1016/j.vaccine.2021.06.072. Epub 2021 Jul 3.PMID: 34226103

A universal influenza vaccine should protect at least through a full season or pandemic wave, and preferably at least one year as recommended by NIAID, but most animal studies are short-term. We show here that a universal influenza vaccine based on conserved antigens nucleoprotein and matrix 2, when given as a single intranasal dose, is effective for at least a full year, with durable antibody and T cell responses and protection against lethal challenge with divergent influenza A and B virus strains.

Foxo1 controls gut homeostasis and commensalism by regulating mucus secretion.

Chen Z, Luo J, Li J, Kim G, Chen ES, Xiao S, Snapper SB, Bao B, An D, Blumberg RS, Lin CH, Wang S, Zhong J, Liu K, Li Q, Wu C, Kuchroo VK.J Exp Med. 2021 Sep 6;218(9):e20210324. doi: 10.1084/jem.20210324. Epub 2021 Jul 21.PMID: 34287641

The host-derived regulatory network that controls mucus secretion and thereby changes gut microbiota has not been fully illustrated. Here, we identify that Forkhead box protein O1 (Foxo1) is critical for gut commensalism and intestinal barrier integrity by regulating goblet cell function.

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CONGRATULATIONS TO DR. ANTHONY FAUCI

for receiving the AAI Exceptional Leadership in Science Award!

Anthony S. Fauci, M.D., DFAAI (AAI '73), Director, National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH), was honored with the AAI Exceptional Leadership in Science Award.

This special award recognizes Dr. Fauci's significant leadership on behalf of science and immunology throughout the COVID-19 pandemic. He has been a guiding voice advocating that public health measures be based on scientific knowledge in addition to supporting the development and delivery of effective vaccines to allow the safe emergence from the pandemic. Congratulations Dr. Fauci!

Dr. Anthony Fauci

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CONGRATULATIONS TO DR. AI ING LIM

for receiving the 2021 ICIS Sidney & Joan Pestka Post-Graduate Award!

Dr. Lim moved obtained her bachelor's and master's degrees at The University of Hong Kong. Subsequently, as a European Union Marie Curie Fellow, she joined Prof. James Di Santo at Pasteur Institute (France) for her Ph.D. There, she identified innate lymphocyte precursors from the blood of healthy individuals. This precursor can give rise to diverse mature innate lymphocytes within tissues, depending on micro-environmental signals. She was also recognized as an International Rising Talents by the L'Oreal-UNESCO and the best European Immunology Thesis (Asteria Doctoral Prize) by the European Federation of Immunological Societies. Together with the Human Frontier Science Program fellowship, these awards led her to join the laboratory of Dr. Yasmine Belkaid at the National Institutes of Health (NIH) for her postdoctoral training. She continues to work around the central question of how maternal environmental exposures impact the offspring's tissue immunity and predisposition to diseases. Congratulations, Dr. Ai Ing Lim, on receiving this prestigious award.

Dr. Ai Ing Lim

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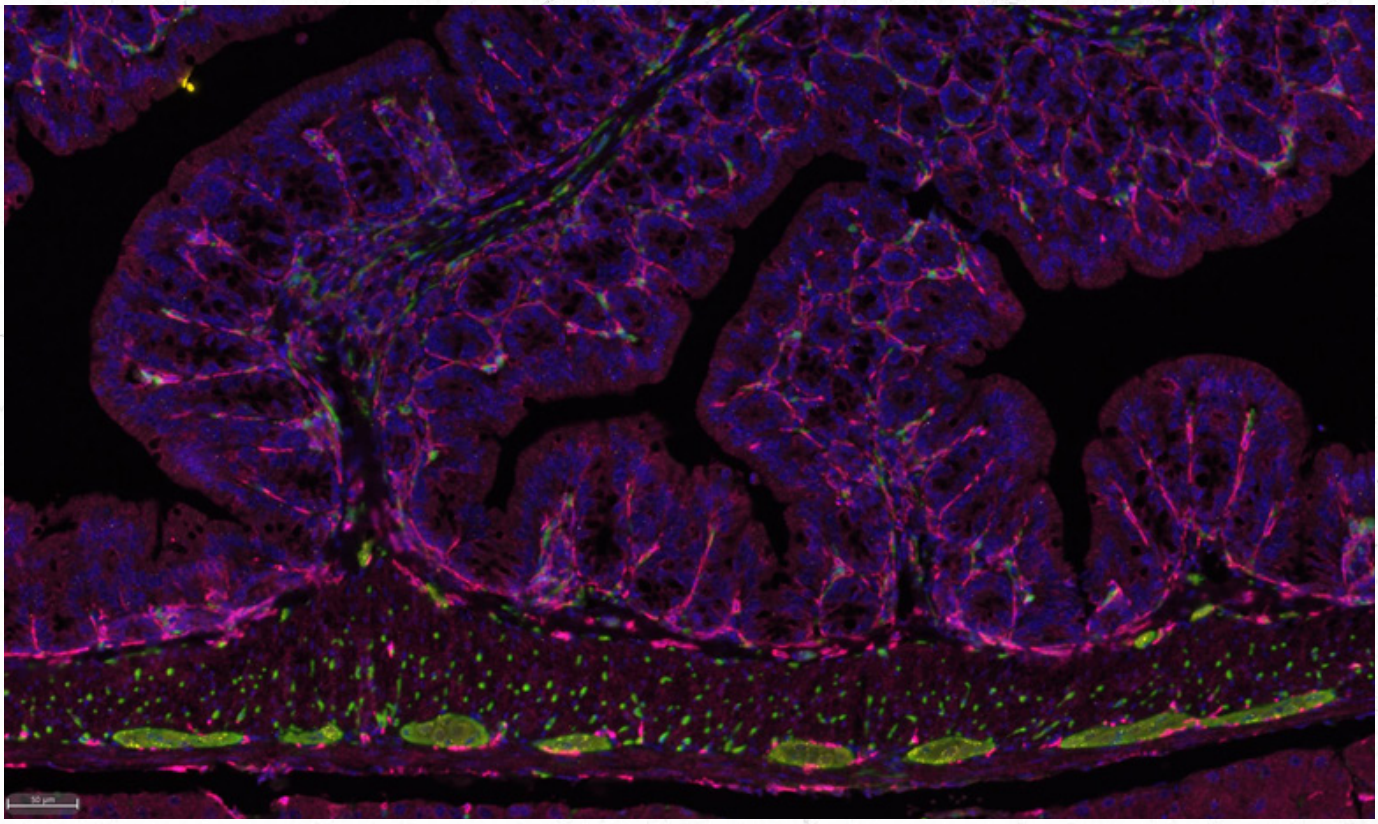

Representative image of RNAscope fluorescent assay using a specific probe to detect α-synuclein (yellow) with DAPI staining for nuclei (blue), immunostaining for macrophage cells (Iba-1, red), and neuronal marker (PGP 9.5, green).

CONTRIBUTED BY:
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