

Curriculum Vitae

Chia-Rui Shen, Ph.D.

Chair and Professor,

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Prof. Chia-Rui Shen received a Ph.D. degree in Immunology from the University of Bristol in United Kingdom, and now is a professor also the Chair at Department of Medical Biotechnology and Laboratory Science, Chang Gung University, Taiwan. Dr. Shen was one of the Council members in the Chinese Society of Immunology (Taipei) (2012-2018) and the Taiwan Artificial Intelligence Application Association (2019-2022). Also, she is the Council member in the Taiwan Society of Chitin and Chitosan (2009-), and the Executive Supervisor in the Taiwan Artificial Intelligence Application Association (2022-). The immune system always attracts attentions due to its efficient induction of antigen specific responses. Dr. Shen's "Medical Immunology Lab" aims to understand the regulation of autoreactive T cell responses and develop specific immunotherapies, gene and cell therapies against hypersensitivity as well as tumors.

Education:

- 1998 Ph.D. Department of Pathology and Microbiology, Faculty of Medicine, University of Bristol, United Kingdom
- 1993 B.Sc. Department of Medical Technology, College of Medicine, National Cheng Kung University, Taiwan.

Professional Appointments:

- 2023.08-present Chair, IACUC committee, Chang Gung University, Taiwan.
- 2022.12-present Executive Supervisor, Taiwan Artificial Intelligence Advancement Association
- 2018.08-present Chair and Professor, Division of Biotechnology, Graduate Institute of Biomedical Sciences, College of Medicine, Chang Gung University, Taiwan.
- 2018.08-present Professor, Master and PhD Program in Biotechnology Industry, College of Medicine, Chang Gung University, Taiwan.
- 2018.08-present Member, IACUC committee, Chang Gung University, Taiwan.
- 2016.01-present Research Fellow, Department of Ophthalmology, Linkuo Chang Gung Memorial Hospital, Taiwan.
- 2008.05-present Council Member, Taiwan Society of Chitin and Chitosan
- 2012.11-2018.11 Council Member, Chinese Society of Immunology
- 2000.02-2018.07 Assistant/Associate Professor, Department of Medical Biotechnology and Laboratory Science, Graduate Institute of Biomedical Science, Master and PhD Program in Biotechnology Industry, Chang Gung University, Taiwan.
- 1998.09-2000.02 Academia Sinica Post-Doctoral Fellow, Institute of Biomedical Science, Academia Sinica, Taiwan.

1993.08-1994.07 Teaching Assistant, Department of Medical Technology, College of Medicine, National Cheng Kung University, Taiwan.

Research Interests:

Immuno-Regulation, Immunotherapy and Vaccine Development, Gene Therapy, Clinical Laboratory Science, Molecular Imaging.

Honor, Awards and Activities (Selected):

- 2021 Invited Speech, the 11th International Congress of Diabetes and Metabolism (ICDM) (Virtual meeting, Korea, 7th -9th Oct, 2021)
- 2020 Distinguished Alumni, College of Medicine, National Cheng Kung University, Taiwan.
- 2019 Excellence Award and Merit Award, AI Smart Application New Generation Talent Cultivation Program, Industry Development Bureau, Ministry of Economic Affairs.
- 2017, 2018 College Student Research Creativity Award (Supervisor), Ministry of Science and Technology (MOST), Taiwan.
- 2017, 2019 Invited Speech, The Asia Islet Biology and Incretin Symposium (AIBIS), Seoul, Korea.
- 2015 Outstanding Faculty Teaching Award, Chang Gung University, Taiwan

USA Patents:

- 1. A Chitin-induced Immune Response Based Method for Diagnosing Allergic Asthma in Patients. 2015 USA Patent US9,005,899.
- 2. Development of asthma therapy with rAAV-mediated AMCase shRNA. 2010 USA Patent US 7,851,616.

Publication:



A. Tumors

- 1. Hsu LJ, Liu CL, Kuo ML, Shen CN, **Shen CR (correspondence)**. An alternative cell therapy for cancers: induced pluripotent stem cell (iPSC)-derived natural killer cells. *Biomedicines* 2021, 9(10), 1323; <https://doi.org/10.3390/biomedicines9101323>.
- 2. **Shen CR**, Chen YS, Hwang YS, Chen HJ, Liu CL. Differential bicistronic gene translation mediated by the internal ribosome entry site element of encephalomyocarditis virus. *Biomed J* 2020 Jun. doi:10.1016/j.bj.2020.06.006.
- 3. Chen YS, Hwang CH, Liu CL, Chen HS, Wu ST, Lee MH, **Shen CR (correspondence)**. Locally targeting the IL-17/ IL-17RA axis reduced tumor growth in a murine B16F10 melanoma model. *Hum Gene Ther* 2019 Mar; 30(3):273-285.
- 4. Lee MH, Chang TC, Liao CT, Chen YS, Kuo ML, **Shen CR (correspondence)**. Interleukin 17 and Peripheral IL-17-Expressing T cells are Negatively Correlated with the Overall

Survival of Head and Neck Cancer Patients. *Oncotarget* 2018 Jan; 9 (11): 9825-9837.

5. Chen YS, **Shen CR (correspondence)**. Immune checkpoint blockade therapy: The 2014 Tang Prize in Biopharmaceutical Science. *Biomed J* 2015 38:5-8.
6. **Shen CR**, Yang WC, Chen HW. The fate of regulatory T cells: survival or apoptosis. *Cell Mol Immunol* 2014 Jan; 11(1):11-13. doi:10.1038/cmi.2013.49.
7. Chen YS, Liu CL, Lee MH, Chen HW, **Shen CR (correspondence)**. The role of Tc17 in cancer immunity and clinical associations. *J Biomed Lab Sci* 2013 Sep; 25(3): 77-83.
8. **Shen CR**, Chen HW. Fatal attraction: tumor recruitment of myeloid-derived suppressor cells is mediated by IL-17-producing CD8+ T cells. *Transl Gastrointest Cancer* 2013 June; 2(S1):119-122. doi: 10.3978/j.issn.2224-4778.2013.05.25.
9. Tsai JP, Lee MH, Hsu SC, Chen MY, Liu SJ, Chang JT, Liao CT, Cheng AJ, Chong P, **Shen CR (correspondence)**, Chen HW. CD4+ T cells disarm or delete cytotoxic T lymphocytes under IL-17-polarizing conditions. *J Immunol* 2012 189:1671-1679.
10. Lee MH, Chang JT, Yu FW, **Shen CR (correspondence)**. The prevalence of IL-17-producing cells in patients with Nasopharyngeal carcinoma. *J Biomed Lab Sci* 2011 Mar; 23(1): 30-37.
11. Chang JT, Kuo TF, Chen YJ, Chiu CC, Lu YC, Li HF, Wang HM, **Shen CR**, Cheng AJ. Highly potent and specific siRNAs against E6 or E7 genes of HPV16- or HPV18-infected cervical cancers. *Cancer Gene Ther* 2010, Dec; 17(12):827-836
12. Hsieh CL, Liu SJ, **Shen CR**, Chen MY, Hsu SC., Tsai JP, Li YS, Yang CJ, Chong P, Chen HW. IL-6-transfected tumor cells modulate the status of CD8+ and CD4+ T cells to control the tumor growth. *Immunobiology* 2010 Jun; 215(6): 486- 491.

B. Hypersensitivity (incl. autoimmunity)

13. Lo SM, Hwang YS, Liu CL, Shen CN, Hong WH, Yang WC, Lee MH, **Shen CR (correspondence)**. Inhibiting TLR7 expression in the retinal pigment epithelium suppresses experimental autoimmune uveitis. *Front Immunol* (accepted for publication) 2021.
14. Yang WC, Hwang YS, **Shen CR (correspondence)**. Interleukin-4. *Encyclopedia of Life Sciences*. John Wiley & Sons, Ltd., 2018 Nov: DOI: 10.1002/978047001592.a0028195
15. Yang WC, Hwang YS, Chen YY, Liu CL, Shen CN, Hong WH, Lo SM, **Shen CR (correspondence)**. Interleukin-4 supports the suppressive immune responses elicited by regulatory T cells. *Front Immunol* 2017 Nov; 8: Article 1508.
16. **Shen CR**, Yang WC, Chen HW. The fate of regulatory T cells: survival or apoptosis. *Cell Mol Immunol* 2014 Jan; 11(1):11-13. doi:10.1038/cmi.2013.49.
17. Yang CJ, Liu YK, Liu CL, Shen CN, Kuo ML, Su CC, Tseng CP, Yen TC, **Shen CR (correspondence)**. Inhibition of acidic mammalian chitinase by RNA interference suppresses OVA-sensitized allergic asthma. *Hum Gene Ther* 2009 Dec; 20(12): 1597- 1606.
18. Hall AM, Ward FJ, **Shen CR (equal to first)**, Rowe C, Bowie L, Devine A, Urbaniak SJ, Elson CJ, Barker RN. Deletion of the dominant autoantigen in NZB mice with autoimmune

hemolytic anemia: effects on autoantibody and T-helper responses. *Blood* 2007 Dec 15; 110(13): 4511- 4517.

19. **Shen CR**, Youssef AR, Devine A, Bowie L, Hall AM, Wraith DC, Elson CJ, Barker RN. Peptides containing a dominant T-cell epitope from red cell band 3 have in vivo immunomodulatory properties in NZB mice with autoimmune hemolytic anemia. *Blood* 2003 Nov 15; 102(10):3800-6.
20. **Shen CR**, Ward FJ, Devine A, Luross JA, Lowrey PA, Wraith DC, Elson CJ, Barker RN. Characterization of the dominant autoreactive T-cell epitope in spontaneous autoimmune haemolytic anaemia of the NZB mouse. *J. Autoimmun.* 2002 Mar; 18(2):149-57.
21. **Shen CR**, Wraith DC, Elson CJ. Splenic but not thymic autoreactive T-cells from New Zealand Black mice respond to a dominant erythrocyte Band 3 peptide. *Immunology.* 1999 Apr; 96(4):595-9.
22. **Shen CR**, Mazza G., Perry FE, Beech JT, Thompson SJ, Corato A, Newton S, Barker RN, Elson CJ. T-helper 1 dominated responses to erythrocyte Band 3 in NZB mice. *Immunology* 1996 Oct; 89(2):195-9.

C. Others

23. Huang SE, Kuo CH, Shiao SY, **Shen CR**, et al. Soluble CD93 lectin-like domain sequesters HMGB1 to ameliorate inflammatory diseases. *Theranostics* 2023;13:4059-4078.
24. Mai XC, **Shen CR (correspondence)**, Liu CL, Trinh DM, Nguyen ML. (2023). "DNA signaturing" database construction for *Tetrademus* species identification and phylogenetic relationships of *Scenedesmus*-like green microalgae (*Scenedesmaceae*, Chlorophyta). *Journal of Phycology*, 00, 1–10. <https://doi.org/10.1111/jpy.1335>.
25. Juang JH, Wang JJ, **Shen CR (equal to first)**, Lin SH, et al. Magnetic Resonance Imaging of Transplanted Porcine Neonatal Pancreatic Cell Clusters Labeled with Exendin-4-Conjugated Manganese Magnetism-Engineered Iron Oxide Nanoparticles. *Nanomaterials* 2022; 12(7):1222. <https://doi.org/10.3390/nano12071222>.
26. Hwang YS, Kang EYC, **Shen CR**, Hong WH, Wu WC. Noncontact optical measurement of aqueous humor glucose levels and correlation with serum glucose levels in rabbit. *Biosensors* 2021; 11:387. <https://doi.org/10.3390/bios11100387>.
27. Juang JH, **Shen CR (equal to first)**, Wang JJ, et al. Exendin-4-conjugated manganese magnetism-engineered iron oxide nanoparticles as a potential magnetic resonance imaging contrast agent for tracking transplanted β -cells. *Nanomaterials* 2021, 11, 3145.
28. Juang JH, Wang JJ, **Shen CR (equal to first)**, Chen CY, et al. Magnetic resonance imaging of transplanted porcine neonatal pancreatic cell clusters labeled with chitosan-coated superparamagnetic iron oxide nanoparticles in mice. *Polymers* 2021 Apr; 13(8), 1238.
29. Elakkat V, Chang CC, Chen JY, Fang YC, **Shen CR (correspondence)**, Liu LK, Lu N. The first two examples of halogen bonding with a sigma hole-donating fluorine in the Csp³-FOsp³ interaction from polyfluorinated trans-dihalo-palladium(II) di-substituted pyridine complexes. *Chem Commun (Camb)*. 2019 Nov; 55(95): 14259-14262.

30. **Shen CR**, Juang HH, Chen HS, Yang CJ, Wu CJ, Lee MH, Hwang YS, Kuo ML, Chen YS, Chen JK, Liu CL. The Correlation between Chitin and Acidic Mammalian Chitinase in Animal Models of Allergic Asthma. *Int J Mol Sci*. 2015 Nov; 16(11): 27371-27377.
31. Hwang YS, Chiang PR, Hong WH, Chiao CC, Chu IM, Hsiue GH, **Shen CR (correspondence)**. Study *in vivo* intraocular biocompatibility of *in situ* gelation hydrogels: Poly (2-ethyl oxazoline)- block- poly (<epsilon>- caprolactone)- block- poly (2- ethyloxazoline) Copolymer, Matrigel and Pluronic F127. *PLoS One* 2013 July; (7): e67495.
32. Hsu PH, Wei KC, Huang CY, Wen CJ, Yen TC, Liu CL, Lin YT, Chen JC, **Shen CR (correspondence)**, Liu HL. Noninvasive and targeted gene delivery into the brain using microbubble-facilitated focused ultrasound. *PLoS One* 2013 Feb; 8(2): e57682.
33. Tsai ZT, Tsai FJ, Yang WC, Wang JF, Liu CL, **Shen CR (correspondence)**, Yen TC. Preparation and characterization of ferrofluid stabilized with biocompatible chitosan and dextran sulfate hybrid biopolymer as a potential MRI T2 contrast agent. *Mar Drugs* 2012; 10(11), 2403-2414.
34. **Shen CR**, Wu ST, Tsai ZT, Wang JJ, Yen TC, Tsai JS, Liu CL. Characterization of the Quaternized chitosan-stabilized iron-oxide nanoparticles as a novel potential MRI contrast agent for cell tracking. *Poly International* 2011 Jun 60(6): 945-950
35. **Shen CR (correspondence)**, Juang JH, Tsai ZT, Wu ST, Tsai FY, Wang JJ, Yen TC. Preparation, characterization and application of superparamagnetic iron oxide encapsulated with N-[(2-hydroxy-3-trimethylammonium) propyl] chitosan chloride. *Carbohydr Polym* 2011 Mar; 84(1): 781- 787.
36. Juang JH, **Shen CR (equal to first)**, Wang, JJ, Kuo CH, Lin MY, Wu ST, Tsai ZT, Yen TC. Magnetic resonance imaging study of mouse islet allotransplantation. *Transplant Proc* 2010 Dec;42(10):4217-20.
37. Chen JK, **Shen CR (equal to first)**, Liu CL. N-acetyl-glucosamine: Production and Applications (invited review). *Mar Drugs* 2010 Sep 15; 8(9):2493-2516.
38. Liu YK, Yang CJ, Liu CL, **Shen CR**, Shiao LD. Using a fed-batch culture strategy to enhance rAAV production in the baculovirus/insect cell system. *J Biosci Bioeng* 2010 Aug; 110(2):187-193.
39. Cherng JY, Liu CC, **Shen CR**, Chen LY, Shih MF. Beneficial effects of Chlorella-11 peptide on blocking LPS-induced macrophage activation and alleviating thermal injury-induced inflammation in rats. *Int J Immunopathol Pharmacol* 2010 Jul-Sep; 23(3):811-820.
40. Shih MF, Cheng YD, **Shen CR**, Cherng JY. A molecular pharmacology study into the anti-inflammatory actions of *Euphorbia hirta* L. on the LPS-induced RAW 264.7 cells through a selective iNOS protein inhibition. *J Natural Medicine* 2010 Jul, 64(3): 330-5.
41. **Shen CR**, Chen, YS, Yang, CJ, Chen, JK, Liu CL. Colloid chitin azure is a dispersible, low-cost, substrate for chitinase measurements in a sensitive fast reproducible assay. *J Biomol Screen* 2010 Feb; 15(2): 213- 217.
42. Liu CL, **Shen CR (equal to first)**, Hsu FF, Chen JK, Wu PT et al. Isolation and identification

of two novel SDS-resistant secreted chitinases from *Aeromonas schubertii*. *Biotechnol Prog* 2009 Jan-Feb; 25(1): 124-131.