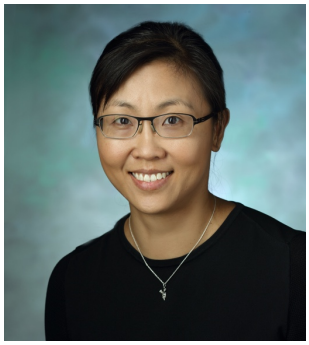
Curriculum Vitae



Sing Yian CHEW, *Ph.D.*
Associate Professor
School of Chemistry, Chemical Engineering & Biotechnology, Lee Kong Chian School of Medicine, School of Materials Science & Engineering,
Nanyang Technological University (NTU)
62 Nanyang Drive, N1.2-B2-20, Singapore 637459
Phone: +65-6316-8812; Email: sychew@ntu.edu.sg
Website: https://personal.ntu.edu.sg/sychew
Singapore citizen
ORCID: 0000-0002-6084-5967

Education

2002 – 2006	**Ph.D., Materials Science & Engineering**, Johns Hopkins University, Baltimore, MD Advisor: Kam W. Leong, Ph.D.
1997 – 2001	**Bachelor of Mechanical & Production Engineering**, NTU, First Class Honors, **Valedictorian**

Current Positions

2012 – present	**Associate Professor** (70%)**,** School of Chemical & Biomedical Engineering**,** NTU
2014 – present	**Associate Professor** (30%), Lee Kong Chian School of Medicine, NTU
2021 – present	**Associate Professor** (courtesy)**,** School of Materials Science & Engineering**,** NTU

Prior Positions

Jul 2014 – Mar 2017	**Associate Chair (Research)**, School of Chemical & Biomedical Engineering, NTU, Singapore
Aug 2006 – Aug 2012	**Assistant Professor**, Nanyang Technological University, School of Chemical & Biomedical Engineering, Singapore
June – Nov 2017	**Visiting Scientist**, Department of Neurology, Johns Hopkins University, USA
March – May 2017	**Visiting Scientist,** Scottish Center for Regenerative Medicine (SCRM), University of Edinburgh, Edinburgh, Scotland, UK
Dec 2014	**Visiting Scholar**, INSERM U791 (French National Institute of Health and Medical Research) University of Nantes, France
Dec 2013	**Visiting Professor,** GHM Institute of CNS Regeneration, Jinan University, China
May – June 2012	**Visiting Professor,** University of Paris 13, France

Awards/Honors

• Top 2% most cited scientist (single year citation impact 2020, 2019, 2017; career citation impact 2020, 2022 *ref: PLoS Biology*) • SCBE Education Award, Bronze (2016) • Short-listed for Singapore National Academy of Science Young Scientist Award (2013) • Tan Chin Tuan Exchange Fellowship in Engineering (2009) • NTU Overseas Scholarship (2002) • Lee Kuan Yew Gold Medal • Institution of Engineers Singapore Gold Medal (2001) • ExxonMobil Gold Medal (2001) • BP book Prize • Institution of Mechanical Engineers - The Frederic Barnes Waldron Prize (2001)

Key Areas of Research

Pioneered the design and synthesis of electrospun biomimetic scaffolds to promote challenging regeneration of tissues, such as Central Nervous System (CNS), and leads the innovative use of electrospinning & scaffold designs to understand & direct cell fate.

- Neural tissue engineering (traumatic nerve injury treatment)
- Drug/gene delivery
- Myelination
- Electrospinning
- Understanding & controlling cell-substrate interactions (stem cell differentiation; mechanotransduction)
- Scaffold design (3D bioprinting)

Professional Activities/ Contributions

Appointment as Committee/ Group Member/ Advisory Role:

- **Nanyang Technological University Research Council** – EP3 (Biomedical Engineering) subcommittee member (2020 – present)
- **Singapore-MIT Alliance for Research and Technology, Critical Analytics for Manufacturing Personalized-Medicine – SMART CAMP** – Principal Investigator (2019 – present)
- **National Medical Research Council - Open Fund Young Investigators Research Grant** (NMRC OF-YIRG, Singapore) panel member (2019 – present)
- **Scientific Advisory Board** of Legogel ANR project – International scientific advisory board member for National French Research Project, funded by ANR (2018)
- **A*Star Joint Council Office (JCO) Grants Review Panel** (GRP) Member (2016 – 2018)

Service as External Grant Reviewer: • National Medical Research Council, Singapore • Agency for Science, Technology and Research, Singapore • National Research Foundation, Singapore • Research Grant Council of Hong Kong • Singapore Food Story R&D Programme – 1st Alternative Proteins Seed Challenge (2020) • Medical Research Council (MRC) (2019) • Czech Science Foundation (2019) • Swiss National Science Foundation (2019) • Deutsche Forschungsgemeinschaft (DFG)/German Research Foundation (2019) • Netherlands Organisation for Scientific Research (NWO), domain Applied and Engineering Sciences (TTW) (2019, 2022) • Netherlands Organisation for Scientific Research (NWO) Vidi Domain Science, Dutch Research Council, (2019) • MS Society (UK) (2017) • Human Frontiers Science Program (2014)

Session Chair/ Reviewer/ Organizer in International Conferences (Selected)

- **Symposium Co-Chair** – 'Modular tissue engineering, bottom up and injectable strategies, on the way to translation', Tissue Engineering and Regenerative Medicine International Society, Asia Pacific, *TERMIS-AP 2023*, Hong Kong, 16-19 Oct 2022.
- **Symposium Organizer & Chair** – 'Biomimetic Scaffolds for Neural Tissue Regeneration', Tissue Engineering and Regenerative Medicine International Society, Asia Pacific, *TERMIS-AP 2022*, Jeju Island, Korea, 5-8 Oct 2022.
- **Symposium Organizer & Chair** – 'Directing Cell/Tissue Fate by Extracellular Signalling', Tissue Engineering and Regenerative Medicine International Society, Asia Pacific, *TERMIS-AP 2022*, Jeju Island, Korea, 5-8 Oct 2022.
- **International Advisory Board member** – *TERMIS-AP 2022*, Jeju Island, Korea, 5-8 Oct 2022.
- **Symposium Organizer & Chair**, 'RNA Interference to promote tissue regeneration', *TERMIS-World Congress 2018*, Kyoto, Japan, September 2018.
- **Symposium Organizer & Chair**, 'Directing cellular differentiation/ transdifferentiation by extracellular matrix signaling', *TERMIS-AM 2017* Conference, Charlotte, NC, USA, December 3-6, 2017.
- **Symposium Organizer & Cha**ir, 'Neural differentiation / transdifferentiation of stem cells for regenerative medicine', *TERMIS-AP 2016* Conference, Tamsui, Taiwan, September 3-6, 2016.
- **Symposium Organizer & Chair**, 'Directing cellular differentiation/ transdifferentiation by extracellular matrix signaling', *TERMIS-AP 2014* Conference, Daegu, Korea, September 24-27, 2014
- **Session Chair** – Biomaterials for Stem Cell Control – *World Biomaterials Congress 2012***,** Chengdu, China

Service as Editor for international Peer-Reviewed Journals:

- **Associate Editor** – *ACS Applied Materials & Interfaces*, ACS Publications, Oct 2019 – present.
- **Editorial board** - *Biomaterials*, Elsevier B. V. Netherlands, July 2020 – present.
- **Editorial board** - *Tissue Engineering Part A, Part B: Reviews, and Part C: Methods*, Mary Ann Liebert, Inc., Jan 2020 – present,
- **Editorial board (Review Editor)** - *Frontiers in Bioengineering and Biotechnology – Biomaterials*, Frontiers Media S.A., Jan 2020 – present,
- **Editorial board** – *Experimental Neurology*, Elsevier B. V. Netherlands, 2019 – present.
- **Editorial board** – *Journal of Biomedical Materials Part A*, Wiley Periodicals, Inc, 2019 – present.
- **Editorial board** – *Journal of Tissue Engineering*, SAGE Journals, 2019 – present.
- **Editorial board** – *Drug Delivery and Translational Research* - An Official Journal of the Controlled Release Society, 2010 – present. Springer.

- **Forum Issue** – *ACS Applied Materials & Interfaces* special issue, 'Materials & Interfaces in Regenerative Medicine', 2022/2023, ACS Publications.
- **Special Issue Editor** – *Experimental Neurology* special issue, 'Exosomes and secretomes in nerve regeneration & disease progression in the nervous system', 2022. Elsevier B. V. Netherlands.
- **Special Issue Editor** – *Advanced Drug Delivery Reviews* special issue, 'Sequential drug/gene delivery in tissue engineering & regenerative medicine', 2019. Elsevier B. V. Netherlands.
- **Special Issue Editor** – *Experimental Neurology* special issue, 'Engineering approaches to enhance neural tissue regeneration', 2019. Elsevier B. V. Netherlands.
- **Theme Editor** – *Advanced Drug Delivery Reviews* theme issue, 'MicroRNAs in Tissue Engineering & Regenerative Medicine', 2015. Elsevier B. V. Netherlands.
- **Guest Editor** – *Drug Delivery and Translational Research*, Special Issue – Tissue Engineering, 2012. Springer.
- **Theme co-Editor** – *Advanced Drug Delivery Reviews* theme issue, 'Nanofibers in Regenerative Medicine', 2009. Elsevier B. V., Netherlands.

Professional Memberships: • Tissue Engineering and Regenerative Medicine International Society, (TERMIS) Thematic Group (Regenerative Medicine Strategies for the Nervous System) Charter Member • The Society for Neuroscience member • Controlled Release Society

Scientific Activities

Selected Peer-Reviewed Journal Papers: *(FWCI (first/corresponding author): 2.27; Web of Science: h-index: 32, 4,941 citations; Google Scholar: h-index: 36; 6,991 citations)*

Total no. of publications: 83

1. C Y-P Lee, W H Chooi, S-Y Ng, **S Y Chew*** (2022), 'Modulating neuroinflammation through molecular, cellular and biomaterial-based approaches to treat spinal cord injury', *Bioengineering & Translational Medicine*, e10389. **IF: 10.684**
2. N Zhang, J Lin, **S Y Chew*** (2021), 'Neural cell membrane-coated nanoparticles for targeted and enhanced uptake in the central nervous system cells', *ACS Applied Materials & Interfaces*, 13 (47), pp. 55840 - 55850. **IF: 10.383**
3. N Zhang, J Lin, V Lin P H, U Milbreta, J S Chin, E G Y Chew, M M Lian, J N F, W Wu and **S Y Chew*** (2021), 'A 3D Fiber-Hydrogel Based Non-Viral Gene Delivery Platform Reveals that microRNAs Promote Axon Regeneration and Enhance Functional Recovery Following Spinal Cord Injury', *Advanced Science*, 2100805. **IF: 16.806**
4. N Marinval, **S Y Chew*** (2021), 'Mechanotransduction assays for neural regeneration strategies: A focus on glial cells', *APL Bioengineering*, 5, pp. 02150. **IF: 6.586**
5. W Ong, N Marinval, J Lin, M H Nai, Y-S Chong, C Pinese, S Sajikumar, C T Lim, C ffrench-Constant, M E Bechler, **S Y Chew*** (2020), 'Biomimicking Fiber Platform with Tunable Stiffness to Study Mechanotransduction Reveals Stiffness Enhances Oligodendrocyte Differentiation but Impedes Myelination through YAP-Dependent Regulation', *Small*, 16 (37), pp. 2003656. **IF: 13.281.**
6. K Zhang, W H Chooi, S Liu, J S Chin, A Murray, D Nizetic, D Cheng, **S Y Chew*** (2020), 'Localized delivery of CRISPR/dCas9 via layer-by-layer self-assembling peptide coating on nanofibers for neural tissue engineering', *Biomaterials*, 256, pp. 120225. **IF: 12.479.**
7. N Zhang, J Lin, J S Chin, K Y Zhang, **S Y Chew*** (2020), 'Laser microdissection-based axotomy model incorporating the use of biomimicking fiber scaffolds reveals microRNAs promote axon regeneration over long injury distance', *Biomaterials Science*, 8, pp. 6286-6300. **IF: 6.843**
8. J Lin, I Mohamed, P H Lin, H Shirahama, U Milbreta, J L Sieow, Y Peng, M Bugiani, S C Wong, H Levinson, **S Y Chew*** (2020), 'Modulating macrophage phenotype by sustained microRNA delivery improves host-implant integration', *Advanced Healthcare Materials*, 9 (3), 19011257. **IF: 9.933.**
9. J Lin, D Anopas, U Milbreta, P H Lin, J S Chin, N Zhang, W Wu, S K Wee, A Tow, W T Ang, **S Y Chew*** (2019) 'Regenerative rehabilitation: exploring the synergistic effects of rehabilitation and implantation of a bio-functional scaffold in enhancing nerve regeneration', *Biomaterials Science*, 7 (12), pp. 5150-5160. **IF: 6.843.**
10. J S Chin, W H Chooi, H Wang, K W Leong and **S Y Chew*** (2019) 'Scaffold-mediated non-viral delivery platform for CRIPSR/ Cas9-based genome editing', *Acta Biomaterialia*, 90, pp. 60-70. **IF: 8.947.**
11. W Ong, C Pinese, **S Y Chew*** (2019), 'Scaffold-mediated Sequential Drug/Gene Delivery to Promote Nerve Regeneration and Remyelination following Traumatic Nerve Injuries', *Advanced Drug Delivery Reviews*, 149-150, pp. 19-48. **IF: 15.470.**

12. **S Y Chew**[*] (2019), 'Sequential drug/gene delivery in tissue engineering & regenerative medicine', *Advanced Drug Delivery Reviews*, 149-150, pp. 1. **IF: 15.470.**
13. W H Chooi, **S Y Chew**[*] (2019), 'Modulation of cell-cell interactions for neural tissue engineering: Potential therapeutic applications of cell adhesion molecules in nerve regeneration', *Biomaterials*, 197, pp. 327-344. **IF: 12.479.**
14. N Zhang, U Milbreta, J S Chin, C Pinese, H Shirahama, J Lin, W Wu, W Jiang, H Liu and **S Y Chew**[*] (2019), 'Biomimicking fiber scaffold as an effective in vitro and in vivo microRNA screening platform for directing tissue regeneration', *Advanced Science*, 6(9), 1800808. **IF: 16.806.**
15. U Milbreta, J Lin, C Pinese, W Ong, J S Chin, H Shirahama, R Mi, A Williams, M E. Bechler, J Wang, C ffrench-Constant, A Hoke, **S Y Chew**[*] (2019), 'Scaffold-Mediated Sustained, Non-viral Delivery of miR-219/miR-338 Promotes CNS Remyelination', *Molecular Therapy*, 27 (2), pp. 411-423. **IF: 11.454.**

Keynote Presentations

- S Y Chew (2023), 'Biologically-inspired materials for regenerative medicine', **Tissue Engineering and Regenerative Medicine International Society (TERMIS-AP) annual meeting 2023**, Hong Kong, October 16-19, 2023
- S Y Chew (2022), 'Biomimicking scaffolds for understanding & directing neural tissue regeneration', **Tissue Engineering and Regenerative Medicine International Society (TERMIS-AP) annual meeting 2022**, Jeju Island, South Korea, October 5-8, 2022.
- S Y Chew (2021), 'Engineering biomimetic fiber scaffolds: From mimicking the extracellular matrix to neuronal axons', **6th World Congress of the Tissue Engineering and Regenerative Medicine International Society (TERMIS)**, Maastricht (The Netherlands), November 15th to 19th, 2021.
- S Y Chew (2021), 'Biomaterial-mediated non-viral gene delivery', **36th Annual Meeting of the Canadian Biomaterials Society (CBS)**, Waterloo, Canada, 13-15 May 2021.

Book Chapters

1. J S Chin, L Madden, **S Y Chew**, A R J Phillips and D L Becker[*] (2020), 'Wound healing and its imaging', *Imaging Technologies and Transdermal Delivery in Skin Disorders*, Wiley-VCH Verlag GmbH & Co. KGaA.
2. W H Chooi, J S Chin and **S Y Chew**[*] (2021), 'Scaffold-based delivery of CRISPR/Cas9 ribonucleoproteins for genome editing' in Bio-Carrier Vectors, *Methods in Molecular Biology, Springer Nature*, 2211, pp. 183-191.

Selected Patent & Technical Disclosures Filed:

- S Y Chew, A Hoke, R Mi, K W Leong, 'Therapeutic electrospun fiber composition," WO/2007/089259.
- S Y Chew, H J Diao, L H Nguyen, U Milbreta, 'Aligned nanofiber incorporated hydrogels for traumatic nerve injury treatment', NTU NIEO TD (TD/090/14) (US provisional application: 62/014,968)
- S Y Chew, Jiah Shin Chin, Wai Hon Chooi, 'Functionalized Electrospun Fiber Scaffolds for Localized Gene Editing', Singapore provisional patent application number 10201910930P, NTU TD: 2019-115-01-SG PRV
- S Y Chew, K Zhang, W H Chooi, 'Layer-By-Layer Self-Assembling Peptide Coating On Nanofiber Scaffolds As A Localized Delivery Platform', Singapore provisional patent application number 10202002875Q, NTU TD: 2019-380-01-SG PRV
- J Han, S Y Chew, T D Nguyen, J Tan, H Jeon, D Roxby, 'Method For Removing Undifferentiated Cells', SMART Singapore-MIT Alliance for Research and Technology. ILO Ref: 2022-045, MIT Ref: 24584, NTU Ref: 2022-290. Filed: 10 Aug 2022. US Provisional Application No. 63/378,106. Filed 3 October 2022
- J Han, S Y Chew, D Roxby, J Tan, 'Micro Magnetic Resonance Relaxometry (μMRR) for rapid and non-invasive detection of iPSC quality and differentiation', SMART Singapore-MIT Alliance for Research and Technology. ILO Ref: 2022-159, MIT Ref: 24427JD, NTU Ref: 2022-276. Filed May 2022. US Provisional Application No. 63/412,253. Filed October 3 2022 (accorded Dec 6 2022)
- S Y Chew, C Huang, K Y K Lau, T N M Le, M K Jayasinghe, 'Red Blood Cell Extracellular Vesicles Incorporated Into 3D Printed Scaffolds For Spinal Cord Injury Regeneration', NTU Ref: 2023-215-01-SG PRV, Singapore provisional patent application number: 10202301395R (filed May 18 2023)

Selected Research Grants as PI: *External grants: S$ 11,730,120 total; Internal grants: S$1,080,000 total*

- **Ministry of Education Academic Research Fund (MOE AcRF) Tier 1 Grant (**2023-2025) - Modulating the Adaptive Immunity with Biomaterial Designs to Enhance Nerve Regeneration – **S$200,000**
- **ASEM-DUO Fellowship** (Belgium) (2022-2023) - Biofunctionalizing scaffolds for substrate-mediated biochemical delivery to treat nerve injuries – **5,000 Euros**

- **Ministry of Education Academic Research Fund (MOE AcRF) Tier 2 Grant** (2021-2024) - Understanding effects of remyelination on functional recovery after CNS injury – **S$ 970,668**
- **National Research Foundation Intra-CREATE Thematic Grant** (2020-2023) - Engineering Scaffold-Mediated Neural Cell Therapy for Spinal Cord Injury Treatment - **S$4,998,480**
- **Ministry of Education Academic Research Fund (MOE AcRF) Tier 1 Grant** (2020 – 2022) - Establishing a stroke model and regenerative approach – **S$160,000**
- **Evonik (SEA) Pte Ltd** (2020-2021) - Producing electrospun fiber meshes from synthetic biodegradable polymers – **S$ 60,552**
- **Merlion Project** (Singapore-France joint collaboration) (2018-2021) - Synthetic collagen peptide biomaterials for drug/gene delivery in nerve repair – **S$19,700**
- **A*STAR BMRC International Joint Grant – Singapore-China Joint Research Programme** (2016 – 2020) - Establishing a scaffold-mediated approach for non-viral genome editing for regenerative medicine – **S$299,992.80**
- **National Medical Research Council-Cooperative Basic Research Grant** (2016 – 2020) - Enhancing axon regeneration by nanofiber-mediated microRNA delivery for spinal cord injury treatment – **S$1,162,197.64**
- **RRIS Rehabilitation Research Grant** (2016 – 2019) - Exploring new treatment of spinal cord injury by synergizing regenerative medicine and rehabilitation – **S$249,900**

Academic Supervision and Mentoring:

22 post-doctoral fellows; 13 Ph.D. Students (9 graduated, 4 in progress); 2 Masters students (1 graduated, 1 submitted thesis)