CV – Associate Professor LINING 'ARNOLD' JU (PhD awarded 21/12/2013)

Mechanical engineering, Biomechanics and Mechanobiology

Snow Fellow and Heart Foundation Future Leader Fellow - Level 2
Australian Academy of Science John Booker Medal
MIT Technology Review Innovators Under 35
Royal Society of NSW Edgeworth David Medal
Australian Museum Eureka Prize for Outstanding Early Career Researcher
NSW Young Tall Poppy & AMP Tomorrow Maker

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https://www.sydney.edu.au/engineering/about/our-people/academic-staff/arnold-ju.html

ACADEMIC QUALIFICATIONS AND EDUCATION

2023 **Graduate Certificate in Company Directors Course**, Australian Institute of Company Directors, Sydney, Australia.
2021 **Graduate Certificate in Educational Studies** (Higher Education), Faculty of Arts Social Sciences, University of Sydney.
2013 **Ph.D.** in Biomedical Engineering, **Georgia Institute of Technology & Emory University**, Atlanta, USA.
2008 **B.Sc.** in Theoretical Mechanics, **Peking University**, Beijing, China.
2007 Overseas Exchange student, **Stanford University**, Palo Alto, USA.

ACADEMIC APPOINTMENTS

2023-now **Associate Professor**, **Snow Fellow & Heart Foundation Future Leader Fellow**, The University of Sydney, BME School.
2019-22 **Senior Lecturer** and **ARC DECRA Fellow**, The University of Sydney, School of Biomedical Engineering.
2015-19 **Senior Research Officer** and **Australian Heart Foundation Paul Korner Postdoctoral Fellow**, Heart Research Institute.
2014-15 **Postdoctoral Research Associate**, Monash University, Australian Centre for Blood Diseases.
2011 **Visiting scholar**, Oklahoma Medical Research Foundation USA, Cardiovascular Biology Program.

BEST FOUR RELEVANT PUBLICATIONS TO THIS NOMINATION (†CORRESPONDING, #EQUAL FIRST AUTHORS)

I have **75 publications** (38 as corresponding author and 24 as first/equal-first author), including in prestigious journals such as *Nature*, *Nature Materials*, *Nature Communications* (x5), *eLife* (x2), *Science Advances*, *PNAS*, *Advanced Functional Materials*, *JACC* across the disciplines of biomechanics and cardiovascular mechanobiology. I have an **h-index of 25 and 2000+ citations**, 79% of which since 2020, demonstrating upward trajectory of my impact (Google Scholar, May 2024; https://scholar.google.com.au/citations?user=UPe4VfAAAAAJ&hl=en; ORCID: https://orcid.org/0000-0002-7591-0864).

1. **Nature Communications (2024)** – Wang HJ, Wang Y, Mirjavadi SS, Andersen T, Moldovan L, Vatankhah P, Russel B, Jin J, Zhou Z, Li Q, Cox CD, Su QP, **Ju LA**†. (2024) Microscale geometrical modulation of PIEZO1 mediated cell mechanosensing through cytoskeletal redistribution. *Just Accepted* [IF 17.70]
2. **Nature Communications (2024)** – Lv K, Chen S, Xu X, Chiu J, Wang HJ, Han Y, Yang X, Bowley SR, Wang H, Tang Z, Tang N, Yang A, Yang S, Wang J, Jin S, Wu Y, Schmaier AH, **Ju LA,** Hogg PJ, Fang C† (2024) Protein disulfide isomerase cleaves allosteric disulfides in histidine-rich glycoprotein to regulate thrombosis. doi: 10.1038/s41467-024-47493-0 [IF 17.70]
3. **Advanced Functional Materials (2023)** – YC Zhao, Zhang Y, Wang Z, Aye SSS, … Cho AN, Passam F, Ang T, **Ju LA**†**.** "Novel movable typing for personalized Vein-Chips: recapitulate patient-specific Virchow's triad and its contribution to cerebral venous sinus thrombosis in large scale." [IF 19.92]. *We pioneered and patented a clinical image-derived biomanufacturing process.*
4. **Nature (2021)** – Shen B, Tasdogan A, Ubellacker JM, Zhang J, Nosyreva ED, Du L, Murphy MM, Hu S, Yi Y, Kara N, Liu X, Guela S, Jia Y, Ramesh V… **Ju LA**, Hu Z, Crane GM, Zhao Z, Syeda R, Morrison SJ (2021). A mechanosensitive peri-arteriolar niche for osteogenesis and lymphopoiesis. *Nature* 591(7850): 438-444. doi: 10.1038/s41586-021-03298-5. [IF 63.58]
5. **Nature Materials (2019)** – Chen Y#, **Ju LA**#, Zhou F, Liao J, Xue L, Yuan Y, Su QP, Jin D, Lu H, Jackson SP, and Zhu C (2019). An integrin αIIbβ3 intermediate affinity state mediates biomechanical platelet aggregation. *Nature Mat* 18(7): 760-769 doi: 10.1038/s41563-019-0323-6 *Commented by Nature Materials (18(7):661–662) in the same issue.* [IF 47.65].

GRANTS AND FUNDING SOURCES (CI = CHIEF INVESTIGATOR)

Since my PhD conferral, I have been awarded **>$15M** in competitive funding, 70% of which as the lead Chief Investigator (CIA).

Funder	Year	Scheme	Role	Amount $	Grant number and Title
Snow Medical	2024-31	Snow Fellowship	CIA	8,000,000	2022_SF176 "*Mechanobiology inspired*".
ARC	2024	LIEF	CIA	928,291	LE240100010 "*Single-molecule (SMIF)*".
	2024-26	Discovery Project	CIB	561,886	DP240102315 "*Bio-inspired Nanoparti*".
	2024-26	Discovery Project	CIB	597,127	DP240101768 "*Novel mechano-signaling*
	2020-23	Discovery Project	CIA	469,000	DP200101970 "*Integrin Disturbance*".
	2019-22	Discovery Early Career Researcher (DECRA)	CIA	368,000	DE190100609; "*Mechanobiology: new model of integrin activation by tension*".
	2019-20	LIEF	CIM	1,480,000	LE190100130; "*Volumetric Imaging*".
NHMRC & MRFF	2024-27	MRFF Early-Mid Career Researcher Grant	CIA	600,000	MRF2028865; "*Developing Personalised and Portable Point-Of-Care Testing*".
	2023-26	MRFF Cardiovascular Health Mission Grant	CIA	1,200,000	MRF2023977; "*Clinical imaging inspired point-of-care microtechnology*".
	2023-25	MRFF Cardiovascular Health Mission Grant	CIB	1,000,000	MRF2016165; "*CTCA-POC: CT coronary angiography inspired POCT*".
	2021-23	Ideas Grant	CIA	760,684	APP2003904; "*Novel Mechanomedicine*".

	2023	Equipment Grant	CIA	200,000	"Rapp OptoElectronic – EVIDENT"
	2022	Equipment Grant	CIA	200,000	"*SENSOCELL optical tweezers"*
	2021	Equipment Grant	CIA	200,000	*"z-Movi Cell Avidity Analyzer*"
Australian Heart Foundation	2023-24	Vanguard Grant	CIA	75,000	106979; "*Novel aortic valve-on-chip*".
	2022-25	Future Fellowship Level2	CIA	724,033	105863; "*Platelet mechanobiology*"
	2020-21	Future Fellowship Level1	CIA	562,003	102532; Top ranked Paul Korner Award
	2017-18	Postdoctoral Fellowship	CIA	150,000	101285; Top ranked Paul Korner Award
Australian Academy of Science (AAS)	2021	Regional Collaborations Programme	CIA	10,000	"*Hemodynamic analysis for COVID-19-on-a-chip model of blood clotting*".
NSW Health	2021-23	Cardiovascular Capacity Building Program EMCR	CIA	750,000	"*Novel Mechano-medicine' combats deadly sticky blood clots in diabetes*".
NSW Chief Scientist & Engineer	2022	Boosting Business Innovation Program	CIA	50,000	"*3D microvessel-on-chip platform to recapitulate patient mechanobiology*".
Tour de Cure	2023-24	Pioneer Research Grant	CIA	100,000	RSP-391-FY2023 "*BBB on a chip*".
Ramaciotti Foundations	2020-23	Health Investment Grant	CIA	150,000	2020HIG76 "*Bioengineering biochips*".

AWARDS, HONORS AND PRIZES

Nationwide and international level

2023 **John Booker Medal** in Engineering Science, Australian Academy of Science
2023 **Malcolm McIntosh Prize for Physical Scientist** of the Year, Finalist, Prime Minister's Prize for Science
2022 **AMP Tomorrow Maker** (1 out of 20 nationwide across all professions and career types; $75,000).
2021 **MIT Technology Review Innovators Under 35 Asia Pacific** (1 out of 35).
2020 **Eureka Prize for Outstanding Early Career Researcher Finalist**, Australian Museum (1 out of 3 nationwide).
2013-19 **Young Investigator Awards** (x4 times in a row), International Society on Thrombosis and Haemostasis (ISTH).
2019 **Cardiovascular Bioengineering Early-Mid Career Research Award**, National Institute of Health (NIH) (1 out of 4).
2014 **Best Ph.D. Thesis Award**, Sigma Xi, The Scientific Research Honor Society (1 out of 15 in USA).

State, University and institute level

2021 **NSW Early Career Researcher of the Year (Physical Sciences) Finalist**, Premier's Prizes for Science & Engineering.
2020 **NSW Young Tall Poppy**, Australian Institute of Policy and Science (1 out of 12).
2020 **Vice-Chancellor's Award for Outstanding Early Career Researcher**, The University of Sydney (2 winners, $10,000).
2020 **Sir Zelman Cowen Early Career Investigator in Medical Science Prize**, (single winner, $10,000).
2019 **NSW Ministerial Award for Rising Stars in Cardiovascular** (single winner, $5,000 conferred by Minister of Health).
2017 **Annual Health Research Infrastructure Award,** Sydney Local Heal Dist (single winner, $10,000 by Minister of Health).

PATENTS

1. Zhao YC, **Ju LA,** Wang Z, Zhang Y (2024) "*A microfluidic device and method of forming thereof*" Global PCT/AU2024/050185
2. Zhao YC, **Ju LA,** Wang Z (2024). "A clip for holding a microfluidic device" Australia Patent #2023903706.
3. **Ju LA**, Chen W, Liu B, Chen Y and Zhu C (2019). "*Fluorescence Biomembrane Force Probe*", GTRC 7232.

INDUSTRY ENGAGEMENT

2023 **Lumicks** Research Collaboration Agreement ($400K invested) and ARC Industrial Transformation Training Centre co-lead *I led a research collaboration partnership with Lumicks, and delivered the first acoustic force spectroscopy based single-cell avidity analyzer—z-Movi® in Australia. This industry engagment trained more than 100 Australian researchers from UTS, Monash, UQ, Chris O'Brien Lifehouse, Children's Medical Research Institute and Peter MacCallum Cancer Centre. I became the USYD node leader of the ARC training Centre for Cytometry and Emerging Single-cell Solutions (ACCESS).*

2023 Funded by **MRFF** ($1.2M): *I led an international program including Harvard, MIT, NSW Telestroke Service, RPA Haematology and QUT to produce personalised vessel-on-chip microtechnologies to diagnose and monitor recurrent stroke. It particularly benefits the large disadvantaged populations, including regional, aged, pregnant, handicapped, and indigenous.*

2022 Funded by **NSW Boosting Business Innovation Program (BBIP**; $50K), NSW Innovation Research Acceleration Program ($150K) and partnered with AXT Pty Ltd ($100K): *I have established the Sydney Hub for Biomanufacturing Microsystems Engineered Point-of-Care Technologies (SHBME-POCT): Game changer for personalised healthcare delivery.*

PROFESSIONAL CONTRIBUTIONS/SERVICE TO THE DISCIPLINE

2024 Sydney BioDigital Initiative Alliance with Bioengineering Institute of California (UCLA, UCSD etc); Co-founder.
2024 ISTH Scientific Standardisation Committee (SSC): Biorheology Co-chair; Vascular biology Co-chair.
2024 Sydney Biomedical Accelerator (SBA): early-mid career researcher strategic committee.
2022 4th International Symposium on Mechanobiology (ISMB): Nobel Laureate Lecture Host & Organising Committee

MEDIA AND SOCIAL IMPACTS:

2022 'Our microdevices to detect blood clots are leading the charge to help prevent strokes' – I was interviewed by the American Society of Mechanical Engineers (ASME) as well as reported by **7NEWS**, TVBS News (Taiwan – TV), Yahoo Taiwan, The Canberra Times, The Singapore Times, Newcastle Herald and The Queanbeyan Age. (>10,000 reads/downloads).

2021 My research was featured in **MIT Technology Review**, highlighting solutions to better diagnose and monitor heart disease.

2020 I have been interviewed by **Engineers Australia** magazine 'Create' editor Jonathan Bradley to share my cardiovascular engineering research and impact for Australia and pioneering breakthrough in keyhole heart surgery.