



The 27th Annual Conference of the Australasian Society for Biomaterials and Tissue Engineering  
 Wednesday 20 April 2022 - Friday 22 April 2022  
 Melbourne Connect

AEST				Wednesday, 20 April 2022			
08:00 - 19:00				Registration Open			
				FORUM ROOM 1 & 2			
				Chair: A/Prof Daniel HEATH & Dr Amy GELMI			
09:00 - 10:30				Early Career Researcher Development Workshop Hosted by the Australasian Society for Biomaterials and Tissue Engineering			
10:30 - 11:00				Morning Tea			
11:00 - 11:15				Welcome Address			
				Chair: A/Prof Kris KILLIAN			
11:15 - 12:10				3D Bioprinting of cancer organoids : A high-throughput platform for drug screening and cell biology PLENARY LECTURE: Prof Maria KAVALLARIS			
12:10 - 13:10				Lunch			
				FORUM ROOM 1 & 2			
				Chair: Prof Andrea O'CONNOR			
13:10 - 14:05				Engineering the human kidney PLENARY LECTURE: Prof Melissa LITTLE			
				Chair: Dr Anna WATERHOUSE & A/Prof Steven WISE			
14:05 - 15:05				Early Career Researcher Rapid Fire  Mr Gabriel HUYNH Mr Alexander RUHOFF Mr Luke HIPWOOD Ms Yingqi ZHANG Ms Clara Liu CHUNG MING Dr Praveesuda MICHAEL Ms Buddhika GAYANI Mr Xudong CAI			
15:05 - 15:35				Afternoon Tea			
		FORUM ROOM 1		FORUM ROOM 2		FORUM ROOM 3	
		Chair: Ms Veronica GLATTAUER & Dr Rachael MOSES		Chair: Dr Elena JUAN PARDO & Dr Lu FU		Chair: Prof David NISBET & Dr Rachael WOOD	
		Tissue Engineering I		Scaffolds I		Drug Delivery	
15:35 - 15:50		Strategies around novel in-situ heart valve tissue engineering using MEW Mr Michael VERNON		3D Tissue Culture Models and Smart Materials for Dental Tissue Infection and Repair KEYNOTE: Prof Alastair SLOAN		Nanozymes for nitric oxide delivery from endogenous and exogenous prodrugs KEYNOTE: A/Prof Rona CHANDRAWATI	
15:50 - 16:05		Aligning neurons on porous emulsion-templated polymers Mr Bradyn PARKER					
16:05 - 16:20		Development of microporous silk annealed microgel scaffolds Dr Fatemeh KARIMI		Soft electro- and photo- active hydrogels for neural cell stimulation Ms Adriana NASCIMENTO		PEG functionalised chitosan: synthesis optimization and evaluation towards targeted cancer drug delivery applications Dr Anitha SUDHEESH KUMAR	
16:20 - 16:35		Peptide-mediated growth factor gene therapy using extracellular matrix-inspired biomaterials Prof Millicent SULLIVAN		MEW tubular scaffolds with massively tailorable mechanical behaviour Dr Edmund PICKERING		Engineered polymeric nanoneedle arrays for mediating intracellular delivery Mr Hao Zhe YOH	
16:35 - 16:50		Understanding the drivers of variability in kidney organoid tissue formation Dr Kynan LAWLOR		Biomimetic silk biomaterials in cardiovascular device development and tissue vascularisation A/Prof Jelena RNJAK-KOVACINA		Development of the Chemospheres: a localized delivery strategy for chemotherapeutics Ms Lilith CABALLERO AGUILAR	
16:50 - 17:05		Fibrillin-1 Derived Coating Enhances Synthetic Vascular Graft Endothelialisation Dr Bob Shih-Liang LEE		Understanding how to control pore size and alignment in unidirectionally frozen silk-fibroin biomaterials Mr Habib JOUKHDAR		Synthesis and characterisation of chemically conjugated NMN loaded PVA hydrogels for applications in targeted drug delivery Ms Rebecca SEHNERT	
17:05 - 17:20		Biofabrication based on engineered spider silk materials KEYNOTE: Prof Thomas SCHEIBEL		An advanced injectable hydrogel with macroporous structure and self-healing ability for cell delivery and wound healing Dr Haiyan LI		Dynamic cloud point temperature polymer-drug conjugates based on poly(2-oxazoline)s A/Prof Tim DARGAVILLE	
17:20 - 17:35				Snake venom protein-based hydrogel wound sealant for rapid and stable haemostasis Dr Jan LAUKO			
17:35 - 19:00				EXHIBITION SPACE			
				Welcome Reception and Poster session			

Program as of 19 April 2022 and subject to change



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08:00 - 16:30			
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FORUM ROOM 1 & 2			
Chair: Prof Neil CAMERON			
08:30 - 09:25			
Designing bioinks for 3D tissue bioprinting <b>PLENARY LECTURE: Prof. Shrike ZHANG</b>			
09:25 - 09:55			
3D bioprinting of vascularized constructs using versatile gelatin-based bioinks <b>KEYNOTE: A/Prof Khoon LIM</b>			
09:55 - 10:25			
Morning Tea			
FORUM ROOM 1		FORUM ROOM 2	
Chair: Prof Laurence MEAGHER & Dr Carmine ONOFRILLO		Chair: Prof Bryan COAD & Dr Nicholas REYNOLDS	
FORUM ROOM 3		Chair: Prof Sally MCARTHUR & Miss Sally LINZI GAO	
10:25 - 10:40		10:40 - 10:55	
<b>Stem cells and cell therapy</b>		<b>Bionanomaterials</b>	
Substrate mechanical properties bias mesenchymal stromal cell paracrine activity and therapeutic potential <b>Mr Aeolus VILAR</b>		Chitosan-based polymers bind to the endothelial glycocalyx via charge-based mechanisms <b>Dr Lu FU</b>	
Bio-functional porous scaffolds as expansion platforms for mesenchymal stem cells <b>Mr Kuan Un WONG</b>		Stealth Poly(2-oxazoline) nanomaterials for biomedical applications <b>Dr Kristian KEMPE</b>	
10:55 - 11:10		11:10 - 11:25	
Transcriptomic manipulation induced by high-frequency mechanostimulation <b>Miss Lizebona AUGUST AMBATTU</b>		Galium decorated titania nanopores for enhanced soft-tissue integration and antibacterial efficacy <b>Ms Anjana JAYASREE</b>	
Using binary colloidal crystals (BCCs) and CRISPR activation to improve induced pluripotent stem cell differentiation into neurons <b>Dr Raymond WONG</b>		Development of a new 3D printed biomaterial, titanium diamond for implant applications <b>Ms Nour MANI</b>	
11:25 - 11:40		11:40 - 13:10	
Decellularized extracellular matrix produced by iPSC-derived MSCs promotes MSC proliferation and differentiation and regulates secreted factors <b>Dr Tao HUANG</b>		Enhancing the cellular uptake of fluorescent carbon quantum nanodots by cancer cells via lipid cubosomes <b>Dr Jiali ZHAI</b>	
Lunch			
EXHIBITION SPACE			
POSTER SESSION			
FORUM ROOM 1		FORUM ROOM 2	
Chair: Prof Mia WOODRUFF & Dr Kate FRIPIS		Chair: A/Prof Jess FRITH & Dr Edmund PICKERING	
FORUM ROOM 3		Chair: Dr John RAMSHAW & Dr Rodrigo CURVELLO	
13:10 - 13:25		13:25 - 13:40	
<b>Bioengineered Tissue I</b>		<b>Mechanobiology</b>	
Biomaterial-based 3D models of the tumour microenvironment <b>KEYNOTE: A/Prof Daniela LOESSNER</b>		Biomimicry in soft biomaterials: using synthetic chemistry to instill dynamic functionality <b>KEYNOTE: A/Prof Kristopher KILIAN</b>	
13:40 - 13:55		13:55 - 14:10	
3D tissue engineering models for experimental medicine and nanotherapeutics <b>Dr Anna GULLER</b>		Control of osteocyte behaviour by tailoring biomimetic extracellular matrix <b>Ms Jung Un Ally CHOI</b>	
A biomimetic approach to enhance biomaterialization of osteoblast-derived GelMA hydrogels for bone tissue engineering applications <b>Miss Agathe BESSOT</b>		Controlling properties of collagen networks using a synthetic semi flexible polymer <b>Mr Marco ENRIQUEZ</b>	
14:10 - 14:25		14:25 - 14:55	
Silk fibroin vascular graft: enhancing endothelialisation through biomimicry <b>Mrs Shouyuan JIANG</b>		Snake-venom-controlled 3D fibrin platform for wound healing and tissue engineering studies. <b>Mr Zhao WANG</b>	
Afternoon Tea			
FORUM ROOM 1		FORUM ROOM 2	
Chair: Prof Lisbeth GRONDAHL & Dr Anita QUIGLEY		Chair: Dr Fatemeh Karimi & Ms Veronica GLATTAUER	
FORUM ROOM 3		Chair: A/Prof Tim DARGAVILLE & Dr Tao HUANG	
14:55 - 15:10		15:10 - 15:25	
<b>Tissue Engineering III</b>		<b>Immunomodulation Biomaterials</b>	
Gelatin incorporation in VEGF-loaded PVA-Tyramine hydrogels to enhance cellular interaction and vascular infiltration <b>Dr Alessia LONGONI</b>		Hydrogel systems for the bioprinting of cardiac, neural and vascular cells <b>KEYNOTE: Prof Laurence MEAGHER</b>	
One step ultra-low fouling coatings for the selective capture of cells expressing CD44 <b>Dr Helmut THISEN</b>		Using the selective NLRP3-inflammasome inhibitor MCC950 as an alternative drug-elution strategy to improve the performance outcomes of endovascular devices <b>Dr Richard TAN</b>	
15:25 - 15:40		15:40 - 15:55	
Photo-cross-linkable, injectable, and highly adhesive GelMA-glycol chitosan (GelMA-GC) hydrogels for cartilage repair <b>Dr Sattwikes Paul</b>		Immunological optimisation of pore gradient melt electrowrite degradable mesh for treating pelvic organ prolapse. <b>Mr Kalyanashis PAUL</b>	
Towards patient-specific vascular stents: Additive manufacturing of Poly( $\epsilon$ -Caprolactone) mechanically enhanced with graphene oxide <b>Mr Trent BROOKS-RICHARDS</b>		Plasma treatments for germinating seeds and grains: Why plasma's glow causes seeds to grow by shifting where the water goes <b>Dr Bryan COAD</b>	
15:55 - 16:10		16:10 - 16:25	
Hierarchically porous 3D-printed bio-ceramic tissue scaffolds <b>Ms Shareen CHAN</b>		Engineering next generation biodegradable coronary artery stents: mechanically strong, customisable, and drug-eluting devices <b>A/Prof Daniel HEATH</b>	
16:25 - 18:25		19:30	
Annual General Meeting			
ASBTE 2022 Gala Dinner State Library of Victoria			



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08:30 - 15:50			
Registration Open			
FORUM ROOM 1 & 2			
Chair: Prof Andrea O'CONNOR			
09:00 - 09:55			
From stem cells to organoids and assembloids: time to revisit ethical implications of tissue engineering			
PLENARY LECTURE: Prof Megan MUNSIE			
09:55 - 10:25			
Morning Tea			
FORUM ROOM 1	FORUM ROOM 2	FORUM ROOM 3	
Chairs: Prof Penny MARTENS & Dr Lisa WHITE	Chairs: Dr Brooke FARRUGIA & Dr Vipul AGARWAL	Chairs: Dr. Shayanti MUKHERJEE & Dr Anna GULLER	
Tissue Engineering IV	Scaffolds II	Bioengineered Tissue II	
10:25 - 10:40	Mechanically compliant scaffolds for small diameter tissue-engineered vascular grafts (TEVGs) Mr Angus WEEKES	Photocrosslinkable hydrogels for 3D cell culture and tissue engineering KEYNOTE: Dr Christoph MEINERT	
10:40 - 10:55	External Stimulation Platforms for Directing Stem Cell Fate KEYNOTE: Dr Amy GELMI	Plasma-engineered biomimetic scaffolds: A new class of functional platforms for the expansion of mesenchymal stem cells Mr Anyu ZHANG	
10:55 - 11:10	microRNA and porous silicon nanoparticle complexes for enhanced osteogenesis of mesenchymal stromal cells in 3D hydrogels Ms Surakshya SHRESTHA	Complex fibre patterning with melt electrowriting Dr Naomi PAXTON	Evaluating integration in a dynamically loaded ex vivo model of cartilage repair Ms Anna TRENGOVE
11:10 - 11:25	Thiol-acrylate emulsion templated porous polymers and fibrin scaffolds for the formation of in vitro tissue engineered bone-ligament bone constructs Mr Tony HUYNH	Electrospun chitosan-poly(caprolactone) hybrid scaffolds for soft tissue engineering Prof Steven WISE	Establishment of an in vitro skin model to study bacterial infection around percutaneous devices Dr Eleonore BOLLE
11:25 - 11:40	Rapid regeneration of a neovessel with elastic lamellae in a tropoelastin-polyglycerol sebacate small-diameter vascular graft Mr Ziyu WANG	Polymer micro-hollow fibre membranes for cell alignment in neural regeneration applications Dr Rachael WOOD	Tissue engineering a humanized rat model for osteosarcoma research Mr Jonathan GOSPOS
11:40 - 11:55	High-speed AFM for direct visualisation of single-molecule protein adsorption dynamics on functionalised silica nanoparticle coatings Mr Nuwan Dhaushka HEGODA ARACHCHI	Commercial polymers ready to shake up Melt Electrowriting: new capabilities for tissue engineering scaffolds. Miss Raquel SANCHEZ DIAZ	3D vascularized tissue construct using protein-based composites Ms Linyang LIU
11:55 - 12:10	Biofabrication and Tissue Engineering (BiTE) in volumetric muscle loss and hereditary muscle disease Prof Robert KAPSA	Brains and brawn: Engineering skeletal muscle and neural tissues Dr Anita QUIGLEY	Engineered plant-based nanocellulose matrices for organoid models Dr Rodrigo CURVELLO
12:10 - 13:40			
Lunch			
EXHIBITION SPACE			
POSTER SESSION			
FORUM ROOM 1	FORUM ROOM 2	FORUM ROOM 3	
Chairs: Dr Helmut THISSEN & Dr Paul KALLYANASHIS	Chairs: Dr Alessia LONGONI & Dr Naomi PAXTON	Chairs: Dr Ulises Aregueta ROBLES & Dr Shih-Liang LEE	
Clinical and Commercial Translation	Biofabrication	Biointerfaces II	
13:40 - 13:55	3D bioprinting technologies for skin and pharmaceutical applications Dr. Haruka YOSHIE	Tailorable biosignalling interfaces for controlled modulation of cell and tissue responses on glassware, multi-well plates, porous 3D scaffolds and micro/nanoparticles KEYNOTE: Prof Marcela BILEK	
13:55 - 14:10	Biofabrication of human articular cartilage: a path towards the clinical translation KEYNOTE: Dr Serena DUCHI	Extrudability, printability and rheology: A correlation analysis linking critical properties in extrusion-based bioprinting Dr Cathal O'CONNELL	Perfluorinated Liquid-Infused Surfaces for Applications in Anti-Thrombogenic Medical Devices Mr Jun HONG
14:10 - 14:25	Getting bioprinting into the clinic Prof Gordon WALLACE	Contactless analytical methodologies unfold preclinical screening of bioscaffolds for personalised in situ cartilage repair Dr Carmine ONOFRILLO	Biomaterial thrombosis under flow using a novel microfluidic platform Miss Lingzi GAO
14:25 - 14:40	A versatile method to create perfusable, capillary-scale channels in cell-laden hydrogels using melt electrowriting Ms Emily LIU	Influence of Iaponite on the rheological properties of soft matrix bioinks Mr Jordan DAVERN	Hydration layer structure of biofouling resistant nanoparticles Prof Michael HIGGINS
14:40 - 14:55	Carbon dot-based fluorescent nanoprobes for intracellular pH monitoring in 3D environment) Dr Pooria LESANI	Lattice-based reinforcement scaffolds for cartilage engineering via Negative Embodied Sacrificial Template 3D printing Miss Stephanie DOYLE	Truncated vascular endothelial cadherin enhances rapid endothelialization of small diameter synthetic vascular grafts Prof Angus JAMES
14:55 - 15:10	Rapid and highly sensitive electrochemical detection of microRNAs in serum Dr Yu CHEN	Directed Spatial Differentiation of Mesenchymal Stem Cells using Gradient Granular Microgels Mr Thomas MOLLEY	Diamond coated carbon fibre microelectrodes for neural stimulation, recording and neurotransmitter sensing Dr Wei TONG
15:10 - 15:25	Surface modification of polymeric biomaterials by high-velocity embedding of multifunctional porous titanium particles Ms Tzu-Ying LIAO	Diamond coated carbon fibre microelectrodes for neural stimulation, recording and neurotransmitter sensing Dr Wei TONG	
15:25 - 15:40			
Afternoon Tea			
FORUM ROOM 1			
Chair: Prof Neil CAMERON			
15:40 - 16:20			
Awards and Closing Ceremony			

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