



The McGowan Institute is a leading innovator in the field of regenerative medicine. McGowan's commitment to accelerating the technology transition of new therapies, materials and processes is a challenging, enduring endeavor, coupling biology, clinical science and engineering. The essence of this multifaceted pathway is the ability to identify the most productive points for intervention combined with a profile of attitudes and experiences that can be utilized to help position and target translational support. McGowan 230 affiliated faculty and 2000+ trainees have had notable success, in identifying needs and developing solutions.

Since 2001 we have:

- Executed 157 licenses/options with external partners
- Established over 70 industrial partnerships
- Filed 847 invention disclosures
- Filed 760 patents in the United States and over 1500 worldwide
- Have had 140 patents issued in the US
- Executed 200+ CDA's with corporate partners
- Formed 25 companies from McGowan

The McGowan Institute's Mission Statement

- To establish a national center of expertise in regenerative medicine focused on developing and delivering therapies that reestablish tissue and organ function impaired by disease, trauma or congenital abnormalities.
- To foster the next generation of scientific knowledge in regenerative medicine and to share that knowledge with researchers, clinicians and the public through educational activities, training and publications.
- To educate and train scientists and engineers to pursue technologies related to regenerative medicine, and train a generation of clinicians in the implementation of regenerative therapies.
- To support the commercialization of technologies in regenerative medicine and thereby accelerate the translation of research discoveries to clinical implementation and patient benefit.

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McGOWAN INSTITUTE FOR REGENERATIVE MEDICINE
Regeneration Through Innovation™



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The Nation's Most Ambitious Regenerative Medicine Program

At the McGowan Institute for Regenerative Medicine our primary focus is on the development of technology to address tissue and organ insufficiency. We believe that the pursuit of a particular technological approach at the expense of excluding other concepts, risks stifling innovative approaches that may meet the primary objective.

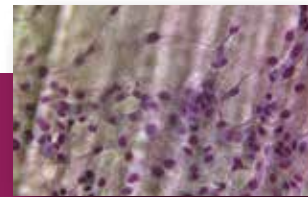
As a result of this philosophy, our researchers' efforts broadly cover:

- The replacement of tissue function with entirely synthetic constructs (such as in artificial organs)
- Functional restoration with constructs that comprise both synthetic and cellular components (such as in biohybrid organs)
- The combination of temporary scaffolds with cellular components (such as in conventional tissue engineering)
- Cellular therapies, including those involving adult stem cells and genetically manipulated cells (such as for the repair of damaged tissue and muscle)

To realize the vast potential of tissue engineering and other techniques aimed at repairing damaged or diseased tissues and organs, the University of Pittsburgh School of Medicine and UPMC Health System established the McGowan Institute for Regenerative Medicine. The McGowan Institute serves as a single base of operations for the University's leading scientists and clinical faculty working to develop tissue engineering, cellular therapies, and artificial and biohybrid organ devices.

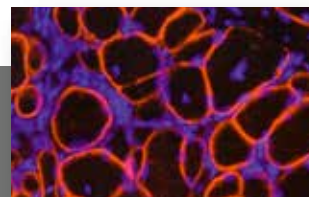
The McGowan Institute is the most ambitious regenerative program in the nation, coupling biology, clinical science and engineering. Success in our mission will impact patients' lives, bring economic benefit, serve to train the next generation of researchers, and advance the expertise of our faculty in the basic sciences, engineering and clinical sciences. Our efforts proudly build upon the pioneering achievements of the Starzl Transplantation Institute in Organ Replacement.

The McGowan Institute for Regenerative Medicine operates under three main pillars of research – Medical Devices and Artificial Organs, Tissue Engineering and Biomaterials, and Cellular Therapies – with a commitment to rapid Clinical Translation.



Tissue Engineering and Biomaterials

Within the Tissue Engineering and Biomaterials program, Institute researchers are working to create biodegradable polymeric materials with appropriate mechanical properties that can be modified to incorporate biological activity. Using these biodegradable materials, tissue engineers are combining temporary scaffolds with cellular components to regenerate tissue.



Cellular Therapies

The field of cellular therapeutics is vast, affording an exciting array of potential applications. Within the Cellular Therapies program, researchers are working with a variety of cells, including stem cells and genetically manipulated cells, to repair or replace cellular function.



Medical Devices and Artificial Organs

The goal of the Medical Devices and Artificial Organs program is to develop and refine technologies that will maintain, improve or even restore the function of diseased organs. Research in this area focuses on efforts to replace tissue function with entirely synthetic constructs (fully artificial organs) or with constructs made of both synthetic and cellular components (biohybrid organs).

McGowan Matrix

A visual aid highlighting key investigators organized by core competencies across medical applications

Projects / Core Competencies	Respiratory (inc. Artificial Lungs)	Liver	Heart, Blood and Vascular Tissue	Pancreas	Gastrointestinal & Genitourinary	Central & Peripheral Nervous System	Musculoskeletal (Hard & Soft Tissue)	Cancer	Wound Healing	Eye and Ear	Dental and Craniofacial	Allograft Technologies
Biomaterials	Cook, Matyjaszewski, Wagner	Gerlach	Badylak, Bettinger, Chun, Feinberg, Gawalt, Kameneva, Phillippi, Sant, Tillman, Tobita, Wagner, Y Wang, Waters, Weinbaum	Banerjee, Beckman, Wagner	Clermont, Tarin, Whitcomb	Beckman, Bettinger, B Brown, Chun, Cui, Marra, Matyjaszewski, Modo, Tyler-Kabara, Y Wang	Badylak, Beckman, B Brown, Campbell, Cancedda, Cheatham, Costello, Feinberg, Kathju, Kumta, Marra, Meyer, Mooney, Nettleship, Nieponice, Sant, Sfeir, Tarin, Tuan, Turner, Wagner, Y Wang, Washburn, Wells, Witte, Woo, Wu	Little, Kalinski, Matyjaszewski, Sant, Whitehead	Badylak, Beckman, Bettinger, B Brown, Gerlach, Little, Manders, Marra, Matyjaszewski, Mooney, Nieponice, Satish, Wagner, Y Wang, Wells, Whitehead	Bettinger, Feinburg, Funderburgh, Little, Steketee, Wagner, Y Wang	B Brown, Chung, Costello, Nettleship, Sant	Marra, Gorantla
Targeted Drug Delivery		Whitehead, Taylor		Gorantla	Whitehead	Marra, Modo, Steketee	Gorantla	Kameneva, Salema, Sant, Whitehead	Marra	Little, Gorantla	Little	Little, Gorantla
Bioengineering, Biotransport, Biomechanics	Borovetz, Cook, Federspiel, Kameneva, Waters	Duncan, Gerlach, Monga, Patzer, Soto-Gutierrez	Antaki, Balazs, Belle, Bermudez, Borovetz, Chun, Feinberg, Gerlach, Kameneva, K Kim, LeDuc, Lohmann, Phillippi, Pinsky, Robertson, Rojas, Sant, Schaub, Severyn, Shroff, Teuteberg, Tillman, Vorp, Wagner, Waters, Weinbaum, Winowich	Banerjee, Gerlach, Parker	Vorp, Whitehead	Chun, Clermont, Cui, Gerlach, Kozai, Modo, Parker, Schwartz, Tyler-Kabara, Weber	Ambrosio, Beckman, Boninger, B Brown, Cancedda, Cheatham, Davidson, Debski, Feinberg, Gharaibeh, Gorantla, Hogan, Kostek, Kumta, LeDuc, Moalli, Mooney, Nettleship, Sfeir, Sigal, Turner, Vorp, Witte, Woo, Yates	Gerlach, Kameneva, Parker, Roy, Whitehead	Badylak, Bettinger, Brienza, Gerlach, Kameneva, Little, Mooney, Satish, Whitehead, Woo	Chan, Federspiel, Feinburg, Little, Loewen, Sigal, Steketee, Wagner	Almarza, Beckman, Benias, Chapman, Chung, Kumta, Little, Sfeir	Little, Gorantla
Cellular and Molecular Biology	Kagan, Liu, Oury, Stolz, Watkins	Bahary, Bell, DeFrances, Duncan, Gerlach, Khan, Lagasse, Mars, Michalopoulos, Monga, Nagaya, Soto-Gutierrez, Stolz, Strom, Taylor, Venkataramanan, Vodovotz, Watkins, Wells, Wu, Zamora, Zarnegar	Baty, Chen, D'Cunha, deVallejo, Gleason, Ho, Isenberg, K Kim, Kuhn, Jayaraman, Mars, Phillippi, Pitt, Salama, Stolz, Vallejo, Watkins, Weinbaum, Wells	Bahary, Banerjee, Lagasse, Stolz, Watkins, Weisz, Whitcomb, Wilson	Bahary, Husain, Lagasse, Stolz, Watkins, Weisz, Whitcomb, Wilson	Bowser, Chen, Cui, Janjic, Kozai, Kwitkowski, Lagenaur, Marra, Modo, Pezzone, Pollock, Sakai, Steketee, Stolz, J Wang, Watkins	Ambrosio, Antaki, Blair, Campbell, Cohen-Karni, deVallejo, Gharaibeh, Gilbert, Gorantla, Larregina, Marra, Mooney, Oesterreich, Phillippi, Rando, Stolz, Szabo-Rogers, Taboas, Tuan, Turner, Vo, B Wang, Watkins, Weiss, Wells, Wu, Yates	V Donnerberg, Duncan, Galson, Hendricks, Ho, Lagasse, Lotze, Mars, Michalopoulos, Monga, Oesterreich, Pitt, Roy, Salama, Stolz, Strom, Taylor, Watkins, Wells, Yang, Zarnegar	deVallejo, Gerlach, Hebda, Kathju, Kellum, Mars, Mooney, Rosen, Satish, Stolz, Turner, Vodovotz, Watkins, Weinbaum, Wells, Yotov	Chan, Conner, Du, Funderburgh, Gorantla, Gross, Hendricks, Loewen, Swamynathan, Wells	Almarza, Benias, Ouyong, Ray, Sfeir, Szabo-Rogers, Taboas	Gorantla
Developmental Biology		Bahary, Duncan, Gerlach, Lagasse, Monga, Oertel, Shin	Bahary, A Donnerberg, Shin, Tobita, Watkins, Wearden	Bahary, Gates, Lagasse, Shin	Bahary, Lagasse, Larregina, Schatten	Steketee	Sakai, Tuan, YL Wang, Zhou	A Donnerberg, V Donnerberg, Lagasse, Monga	Dohar, Gerlach, Hebda, Mooney	Gross, Swamynathan		Lagasse
Micro Tissue Systems & Models		Gerlach, Taylor, Wells	Feinburg, Phillippi, Weinbaum	Banerjee			Feinberg	Sant, Taylor, Wells, Yang	Gerlach, Hebda, Weinbaum	Feinburg		
Stem Cells & Cellular Therapies	Kagan	Fox, Gerlach, Humar, Khan, Lagasse, Nagaya, Soto-Gutierrez, Stolz, Tamama, Taylor, Watkins	deVallejo, Feinberg, Gleason, Kuhn, Marra, Phillippi, JP Rubin, Salama, Tillman, Toma, Vorp	Banerjee, Lagasse, Tamama, Whitcomb	Lagasse, Lotze, Vorp	Gharaibeh, Kokai, Marra, Modo, Sakai, Tuan, Tyler-Kabara, Yang	Ambrosio, S Brown, Campbell, Cancedda, Costello, de Vallejo, Feinberg, Gharaibeh, Gilbert, Gorantla, Kumta, Marra, Rando, JP Rubin, Sfeir, Tuan, VanSwearingen, J Wang, Weiss, Wells, Woo	V Donnerberg, Kalinski, Kokai, Lagasse, Linkov, Michalopoulos, Oesterreich, JP Rubin	Dohar, V Donnerberg, Gerlach, Hebda, Marra, Nieponice, Tamama, J Wang, Wells, Woo	Feinburg, Funderburgh, Nasonkin	Almarza, Chung, Costello, Kumta, Ray, Sfeir	Gorantla, Lagasse, Little
Immunology	Stolz, Watkins	Bell, Lagasse, Mars, Oertel, Stolz, Taylor, Vodovotz, Watkins	Badylak, Bettinger, Brown, Clermont, deVallejo, Fan, Kormos, Mars, Parker, Stolz, Vodovotz, Watkins, Wearden	Gorantla, Lagasse, Whitcomb	Kalinski, Little, Lotze, J Rubin, Vodovotz, Whitcomb	B Brown, Janjic, Modo	Angus, Badylak, B Brown, Clermont, deVallejo, Gorantla, Wearden	deVallejo, Kalinski, Little, Mars, Lotze, Parker, Whitcomb	Angus, Badylak, B Brown, Chadham, Constantine, deVallejo, Ermentrout, Fan, Gorantla, Kellum, Little, Mars, Puyana, Swigon, Vodovotz, Wisniewski	Bettinger, Gorantla, Little	Little	Gorantla, Lagasse
Genomics & Gene Therapies		Whitehead	Toma	Gittes	Clermont, Gittes, Whitehead	Bowser, Glorioso	Cancedda, Gharaibeh, Kumta, Rando, Sfeir, Tuan, B Wang	Billiar, Glorioso, Little, Lotze, Strom, Whitehead	Hebda, Kathju, Little, Satish, Whitehead		Almarza, Kumta, Sfeir	Gorantla
Imaging	Stolz, Watkins	Stolz, Taylor, Watkins	Feinberg, Ho, Pacella, Phillippi, Robertson, Salama, Shroff, Stolz, Villanueva, Wagner, Watkins	Stolz, Watkins, Whitcomb	Lotze, Stolz, Watkins	Modo, Steketee, Stolz, Watkins	Feinberg, Gharaibeh, Gorantla, Robertson, Stolz, Turner, Verdellis, Watkins	V Donnerberg, Ho, Kalinski, Lotze, Parker, Salama, Stolz, Taylor, Watkins, Wells	Hebda, Stolz, Turner, Watkins	Feinberg, Gorantla, Sigal	Verdelis	Gorantla, Stolz, Watkins
Computational Modeling	Parker, J Rubin	Taylor, Vodovotz, Whitcomb	Kocylidirim, Pinsky, Robertson, Salama, Vorp	Parker, Whitcomb	J Rubin, Whitcomb	Parker, J Rubin		Parker, Whitcomb	Hebda, J Rubin, Vodovotz	Sigal	Ray	
Clinical Translation	Wearden	Clermont, DeFrances, Demetris, Fontes, Fox, Gerlach, Humar, Lagasse, Lopez, Mars, Mazariegos, Patzer, Taylor, Whitcomb	Baty, Bermudez, Carpenter, Clermont, Corcos, D'Cunha, A Donnerberg, Gleason, Isenberg, Kellum, Kocylidirim, Kormos, Kreuzer, JS Lee, Lohmann, Luketich, Mars, McNamara, Pacella, Phillippi, Pinsky, Robertson, Salama, Schaub, Schwartzman, Shigamuro, Shroff, Sharma, Simon, Sullivan, Teuteberg, Tillman, Wearden, Winowich	Clermont, Gittes, Whitcomb	Clermont, Docimo, Gittes, Husain, Tarin, Whitcomb, Wilson	Boninger, Bowser, Marra, Okonkwo, Richardson, JP Rubin, Tyler-Kabara	Ambrosio, Badylak, Baer, S Brown, Cancedda, Carpenter, Cheatham, Clermont, Constantine, Costello, Davis, Fu, Gharaibeh, Gorantla, Hogan, Kathju, Kostek, Marra, McMahon, Moalli, Nieponice, Poropatich, JP Rubin, Shestak, Taylor, Vo, Woo, Zdanowicz	A Donnerberg, Glorioso, Kalinski, Lagasse, Linkov, Lotze, Luketich, Mars, Monga, Parker, Strom, Taylor, Whitcomb	Badylak, Corcos, Dohar, Falo, Gerlach, Gorantla, Hebda, Hirsch, Kellum, Manders, Marra, Mars, Nieponice, Poropatich, Rosen, JP Rubin, Shestak, J Wang, Ziembecki	Conner, Funderburgh, Gorantla, Hirsch, Little, Loewen, Yu	Chung, Costello, Little, Sfeir	Gorantla, JP Rubin
Clinical Outcomes (Rehabilitation)	Dew	Dew	Dew, Kocylidirim, Pinsky, Wearden	Whitcomb		Boninger, Bowser, Nindl, Pollock, Okonkwo, Weber	Ambrosio, Brubaker, Cooper, Delitto, Ding, Kostek, JP Rubin, VanSwearingen, Weber, Zdanowicz, Zhou	V Donnerberg, Gorantla	Brienza, Brubaker	Loewen	Cohn	Gorantla