



**Contact Information:**

Randall Alley, CEO, biodesigns, inc.

850 Hampshire Rd., Ste. S

Westlake Village, CA 91361

P: 800.775.2870 C: 310.291.4543

E: [ralley@biodesigns.com](mailto:ralley@biodesigns.com)

W: [www.biodesigns.com](http://www.biodesigns.com)

Randall Alley (pictured with Carrie, DEKA Research & Development's bionic arm "test pilot") is CEO, Chief Prosthetist and Head of User-Interface Technology for biodesigns, a clinical services and R&D facility specializing in the optimization of human interfaces for prostheses, orthoses, exoskeletons, robotics and wearable technology. Alley is a board certified prosthetist and received both his prosthetic certificate and Bachelor of Science in Kinesiology from UCLA. Alley's clinical experience and intimate understanding of force, pressure, shear, rotation, tissue management, weight, and feedback, especially in relationship to wearer device usability and acceptance, lead him to redefine human device connection platforms. Alley holds numerous patents for his interface attachment technologies, methods and systems, with his focus of study on non-surgical, non-invasive performance-enhancing interface systems designed to provide improved feedback, proprioception, and efficiency of movement.

Alley has 30 years' experience successfully fitting challenging prosthetic patients, many with extremely short residual limbs, with technologically advanced but often heavy componentry. As co-founder and former director for the world's largest upper limb prosthetic program, Hanger Prosthetics and Orthotics (HPO), Alley traveled the U.S. and abroad working on hundreds of complex prosthetic cases, often requiring him to create new solutions and approaches in real-time. It was out of his dissatisfaction with the numerous inherent flaws in the standard-of-care socket designs, including discomfort, poor performance, and instability, that inspired him to dedicate his career to improving the interface. Alley introduced to the field multiple prosthetic interface designs including the X-Frame, ACCI (Anatomically Contoured and Controlled Interface), and the High-Fidelity Interface, proving superior biomechanical principles could result in improved comfort and function.

Alley's work goes a step further as his goal is complete device embodiment, i.e. being one with the device or attached item. Alley has already begun to document this phenomenon in his clinic as his patients regularly report with his designs their prosthesis feels like a part of them, feels connected to them. Many report phantom sensations returning to their limb, allowing users to "feel" the ground and prevent falls and stumbles, one of the biggest challenges currently with prosthetics and orthotics. This degree of acceptance and embodiment breaks the boundaries on what many thought was possible in a non-surgical, non-sensorized attachment design, and is the basis for all of Alley's attachment approaches.

Alley's experience extends beyond his clinic and R&D work. He was the interface consultant hired by DEKA Research and Development for the Defense Advanced Research Projects Agency's (DARPA) "Revolutionizing Prosthetics" program, aimed to develop the next-generation upper limb prosthesis for the military (a.k.a. the "Luke Arm"). In this role, Alley sought to solve the challenge of poor user acceptance of the highly functional, yet heavy, advanced dexterous arm system. This project allowed

Alley's connection designs to be tested with physician oversight and proved to be the ideal interface platform for the DEKA arm. His success with the DEKA project led to a 1.5M Direct to Phase II plus Option DARPA SBIR contract for biodesigns. Alley, as the Principal Investigator, is leading the development of unique sensorized fitment tools to standardize and optimize the interface fitting process and research and development on an innovative dynamic modular interface design. As a result of this project, Alley will begin to establish the metrics to relate fitment diagnostics to prosthesis performance, defining fitment criteria for ideal attachment technology.

In addition to his research and practice, Alley has dedicated much of his career to educating prosthetists and other allied health professionals on biomechanically sound attachment techniques and designs domestically and abroad, including several NHS facilities. Alley has presented at numerous educational seminars, congresses, and military hospitals, including presenting his DARPA work at the Hand Proprioception and Touch Interfaces (HAPTIX) efforts for Reestablishing the Neuromuscular Connection in 2017 and 2018.

He also was a clinical columnist and has contributed to five upper limb textbooks. His accolades include a Certificate of Appreciation from the Department of the Army for his upper limb training of military medical personnel, NovaCare Orthotics and Prosthetics' Chairman's Award, the Excellence Award for Innovation from Hanger Inc. as Director of Clinical Development for Innovative Neurotronics, the Clinical Creativity Award and a Fellow from the American Academy of Orthotists & Prosthetists (AAOP), the Red Dot Product Design Award and the 2016 IEEE Design Award for his HiFi Interface System. Alley has appeared in national and local magazines, newspapers, radio and television programs including Good Morning America and the Doctors.