

David Dean, Ph.D.

David Dean earned the Ph.D. degree at the Graduate Center of the City University of New York (New York, NY) in 1993. His graduate studies were in comparative anatomy with an emphasis on geometric morphometrics (shape statistics). His doctoral research led to a system for averaging 3D CT surface images of the human skull. Next, as a Postdoctoral Researcher at the Institute of Reconstructive Plastic Surgery at New York University, Dr. Dean focused on the use of average skull images for diagnostics and surgical planning. In July 1994 he joined the faculty of the School of Medicine at Case Western Reserve University (CWRU) (Cleveland, OH). At CWRU's Department of Neurological Surgery, he pioneered the use of average skull images for the design and 3D printing of custom, inert implants and surgical guides for the repair of large craniofacial defects. In November 1998, that research led to the founding of Osteoplastics, Inc. (Cleveland, OH) for the commercial production of craniofacial implants and surgical guides. These activities also led Dr. Dean to begin research on biomaterials for bone tissue engineering. His first US National Institutes of Health (NIH) R01 grant was titled: "Strength and Resorption of Biodegradable Skull Implants". That project included a collaboration with Dr. Antonios Mikos, Rice University (Houston, TX) on the resorbable material, poly(propylene fumarate) (PPF). In 2003, Dr. Dean was an inventor on a patent, and later published a paper (cited 484 times), demonstrating the first process to prepare and 3D print photo-crosslinkable PPF resins. Later in the 2000's Dr. Dean began working on metallic biomaterials in order to develop stiffness-matched skeletal fixation devices. That research inaugurated a collaboration with Dr. Mohammad Elahinia (University of Toledo, Toledo, OH) on 3D printing NiTi and resorbable Mg alloys. In 2013, Dr. Dean's primary appointment moved from CWRU's Neurological Surgery Department at CWRU to a tenured position in the Department of Plastic Surgery at The Ohio State University (OSU) (Columbus, OH). At OSU he also has a partial appointment in the Department of Materials Science and Engineering and is a member of the Center for Regenerative Medicine and Cell-Based Therapies and the Institute for Materials Research. In 2014, Dr. Dean's collaboration with Dr. Matthew Becker (University of Akron, Akron, OH) resulted in a new method to synthesize PPF that allows inexpensive scale-up to large batches. In 2015, Drs. Becker and Dean collaborated on the founding of 3DBioResins, LLC (Akron, OH) in order to make PPF available to the research and clinical communities. In 2016, Drs. Dean and Elahinia collaborated on the founding of RegenFix, LLC (Toledo, OH), a company that 3D prints NiTi skeletal fixation devices. Dr. Dean has authored 81 journal papers, 33 proceedings manuscripts, 17 book chapters, and 2 books. He has an h-index of 37. He is leading one of five foundational courses, Additive Manufacturing for Bio-Medical Devices (MATSCEN 5194), in the OSU College of Engineering's new Additive Manufacturing curriculum (<https://mgel.osu.edu/technical-track-options/additive-manufacturing>). Dr. Dean is a co-founder and immediate past-Chair of TERMIS-AM's (Tissue Engineering and Regenerative Medicine International Society-Americas Chapter) Biofabrication and Bioreactor TWIG (Thematic Working Interest Group). He serves on the Society of Manufacturing Engineers' Medical AM/3DP Workgroup, the Scientific Advisory Board for the medical conference at the annual RAPID + TCT meeting. Dr. Dean serves as an Associate Editor of Virtual and Physical Prototyping (Taylor & Francis), Progress in Additive Manufacturing (Springer Nature), and Biomanufacturing Reviews (Springer Nature). In regards to the International Society for Biofabrication, Dr. Dean has published in the society's journal, Biofabrication; attended the ISBF's Biofabrication 2011, 2015, 2016, and 2017 meetings; and has served on the Awards Committee since 2016. This year Dr. Dean and Dr. Ed Herderick (Director of Additive Manufacturing at OSU's Center for Design and Manufacturing Excellence) applied to Co-Chair and host the ISBF's Biofabrication 2019 meeting at OSU. Their application was selected! Dr. Dean's accomplishments qualify him to serve on the ISBF's Board of Directors. Should he be elected, his professional affiliations would facilitate the ISBF's current and potential new interactions with other societies with overlapping interests. Most importantly, he has demonstrated a strong commitment to the ISBF's mission of promoting the field of biofabrication.