

Carlijn Bouten

Cell-Matrix Interaction for Cardiovascular Tissue Regeneration, Tue, the Netherlands

Carlijn Bouten was trained in functional anatomy and biomechanics as well as muscle physiology at the department of Human Movement Sciences of Vrije Universiteit Amsterdam, where she received her MSc degree in 1991. In 1995, she obtained her PhD degree from Eindhoven University of Technology (TU/e, the Netherlands). She performed postdoctoral research at the Université Laval (Quebec), University of London, and at TU/e. In 1998, she was appointed assistant professor in Cellular Biomechanics in the department of Mechanical Engineering at TU/e, where she started the laboratory for Cell and Tissue Engineering. This is a shared research facility, currently hosting over 100 MSc students, PhD students, technicians and PIs. The research has gained global recognition due to a unique combination of experimental and computational modeling approaches. In 2002 Bouten became associate professor of Tissue Engineering in the department of Biomedical Engineering at TU/e and in 2010 she was appointed full professor of Cell-Matrix Interaction in Cardiovascular Regeneration. She is a recipient of the Aspasia Career Development award of the Dutch Science Foundation NWO (2002), which awarded her a VICI grant for her research on heart valve tissue engineering in 2003. From 2005-2010 Bouten was member of The Young Academy of the Royal Netherlands Academy of Arts and Sciences (KNAW). Since 2017, she leads the national gravitation program Materials-Driven Regeneration. In that same year she was elected member of the KNAW.

Her current research concentrates on the interplay between living cells and the mechanobiological cues originating from the extracellular matrix under conditions of tissue growth, adaptation, and regeneration and degeneration. She uses 'living' model systems at different length scales (cell, cell-matrix, engineered tissue, native tissue) to quantify these aspects, preferably in real-time. The obtained fundamental knowledge is applied in engineering approaches to regenerate living tissues, in particular for the human heart. A prominent example is the development of a synthetic, biodegradable heart valve prosthesis that seduces the body to create a new, living heart valve at the site of implantation. Bouten performs her multidisciplinary research in close collaboration with material scientists, life scientists, clinicians, and medtech spin-offs.

For more information see: <https://www.tue.nl/en/research/researchers/carlijn-bouten/>