Biodegradation of functionalized textiles with protective properties

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The introduction of nanotechnology into chemical textile finishing processes has enabled remarkable progress in the development of textiles with various protective properties, such as water and oil repellence, self-cleaning, antimicrobial, fire resistance, wrinkle resistance, etc. Such functionalized products have been on the market for many years and are widely used in both the apparel and technical textile industries, especially medical textiles, automotive textiles, and textiles in defence. Functional protective properties are achieved by applying various finishing agents to the surface of textiles, which, although present in low concentrations, alter the surface properties of textile fibres, which can have a significant impact on their biodegradation process. The latter is of particular importance for the disposal of textiles at the end of their life cycle when these products enter the waste stream. Accordingly, the basic process of textile fibre biodegradation and the influence of various finishes, *e.g.* easy-care, repellent and antimicrobial bio-barrier forming and controlled release on the biodegradability of cellulose fibres is presented. The findings obtained and the knowledge gained are the result of years of research by researchers from the Faculty of Natural Sciences and Engineering of the University of Ljubljana, which was also carried out in valuable cooperation with researchers from the Innovation Centre of the Faculty of Technology and Metallurgy of the University of Belgrade.

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Brigita Tomšič is an assistant professor at the Faculty of Natural Sciences and Engineering, University of Ljubljana. Her research and pedagogic activities include chemical finishing of textiles and textile care with a focus on antimicrobial properties to ensure surface hygiene of textiles. In 2010, she was a postdoctoral researcher at the University of Twente in Enschede, the Netherlands, under mentorship of prof. dr. Dragan Jocić. She has supervised one completed PhD thesis and is currently supervising two PhD students. She has co-authored 70 scientific papers that have been cited more than 1400 times (WoS source). She has collaborated in 13 national and international projects. She is a member of the Association of Textile Engineers and Technicians of Slovenia.