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Cataract – The dawning of a new age in its prevention and treatment

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Nataract is still the major cause of blindness. There are multiple mechanism(s) and it is also emerging that some cataracts are staging points rather than endpoints as revealed recently by the effects of oxysterols on age-related and congenital cataract in animal models. The eve lens is a deceptively simple tissue. The single cell layered lens epithelium is a key player in cataractogenesis and in the response to surgical intervention. Our research addresses fundamental questions such as how do cells know their relative position in a tissue? What emergent properties are important for tissue formation? We believe that at least part of the answer to these questions lies in the lens epithelium. It is here that the iconic hexagonal shape of the lens fiber cells and the consequential spatial order of the lens are established. During development this is easy to rationalize as the lens increases layer by layer onto a preformed template, but what happens when the lens regenerates? What determines the organization of the lens fiber cells in that scenario? We have built an interdisciplinary research team (John Girkin, Chris Saunter (Physics), Jun Jie Wu and Boguslaw Obara (SECS) with skills needed to study cell dynamics in the living zebrafish and in regenerating rat lenses. We have produced a mathematical model for the lens epithelium and we hope eventually to have a finite element model for lens accommodation. In this presentation, I shall use selected examples from my research portfolio on radiation-induced, congenital and age-related cataract.

Biography

Roy A Quinlan trained as a Biochemist at the University of Kent. He joined the Franke lab in Heidelberg as an Alexander von Humboldt fellow (1981) and joined as MRC fellow in Cambridge (1985). He worked as a Lecturer and Senior Lecturer in the School of Life Sciences, Dundee University (1988-2001). He was the Foundation Chair in Biomedical Sciences at Durham University (2001). His H-index is currently 43. He serves as lens section Editor for Experimental Eye Research and is currently a Scientific Trustee for Fight for Sight UK.

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