



## The Mathematical Neuro-Oncology Research Lab Presents



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## A computational modelling approach for deriving biomarkers for cancer risk in premalignant disease

**FRIDAY, SEPTEMBER 19<sup>TH</sup>, 2014**  
**1:00 PM – 2:00 PM**  
**ARKES PAVILION,**  
**676 N. SAINT CLAIR ST. SUITE 1300**  
**MATHEMATICAL NEURO-ONCOLOGY LAB**

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Carcinogenesis is an evolutionary process, so biomarkers for cancer prognosis are fundamentally measures that attempt to predict the future course of cancer evolution. How best should we measure the evolutionary process to derive prognostic value? Here we derive evolutionary-motivated biomarkers from an analysis of a computational model of carcinogenesis in premalignant disease. We propose a novel measure of heterogeneity, termed the positive proliferation index, that is the strongest predictor of outcome of all indices studied in our model. These findings suggest biomarkers that may be clinically validated in future studies to ultimately improve risk stratification among patients with premalignant disease.

Alex has held a Research Fellowship in Computational Science associated with the 2020 Science project, a collaborative research programme based at the University of Oxford, University College London and Microsoft Research, Cambridge since 2011. Dr. Fletcher is a member of the Wolfson Centre for Mathematical Biology (WCMB) at the Mathematical Institute, University of Oxford and a stipendiary lecturer at St Hugh's College, Oxford. The main focus of his research is to advance the application of, and mathematics underlying, models of epithelial tissues in development, health and disease.

Alex is active on social media, follow him on Twitter at [@AlexGFletcher](https://twitter.com/AlexGFletcher)

