

## PREDICTING DISEASE PROGRESSION

A team lead by Professor Ken Smith has developed a method for predicting prognosis in relapsing - remitting autoimmune disease and acute rejection following kidney transplantation:

- The technique is based on measuring gene expression in CD8 T-cells by microarray or quantitative PCR analysis.
- Data currently available from ANCA-associated vasculitis (n=70), inflammatory bowel disease (Ulcerative Colitis and Crohn's disease) (n=80), lupus (SLE, n=75) and renal transplantation (n=90).

### Potential uses

- Identifying patient subgroups that may benefit from more intensive immunosuppressive therapy or the use of a more expensive novel therapy. Conversely, reducing the total immunosuppressive load in patients at low risk of disease relapse, reducing therapy associated toxicity.
- Improved patient stratification in clinical trials to increase the ability to detect a therapeutic effect with a novel agent.
- Predicting a subject's response to treatment allows closer monitoring of individuals judged to be most at risk of relapse.

For further information please contact:

Dr Karin Schmitt

✉ [karin.schmitt@enterprise.cam.ac.uk](mailto:karin.schmitt@enterprise.cam.ac.uk)

☎ +44 (0)1223 769280

Cambridge Enterprise Limited, University of Cambridge  
3 Charles Babbage Road, Cambridge CB3 0GT UK  
[www.enterprise.cam.ac.uk](http://www.enterprise.cam.ac.uk)

### Background

Immunosuppressive therapy for autoimmune disease is effective but toxic. Methods for guiding individualised treatment to increase efficacy and reduce toxicity are not currently available. Treatment usually involves an initial period of intensive therapy at first presentation followed by maintenance therapy aimed at preventing disease recurrence. Progression varies widely between individuals. No biomarker analysis to date has been proven as a prognostic indicator.

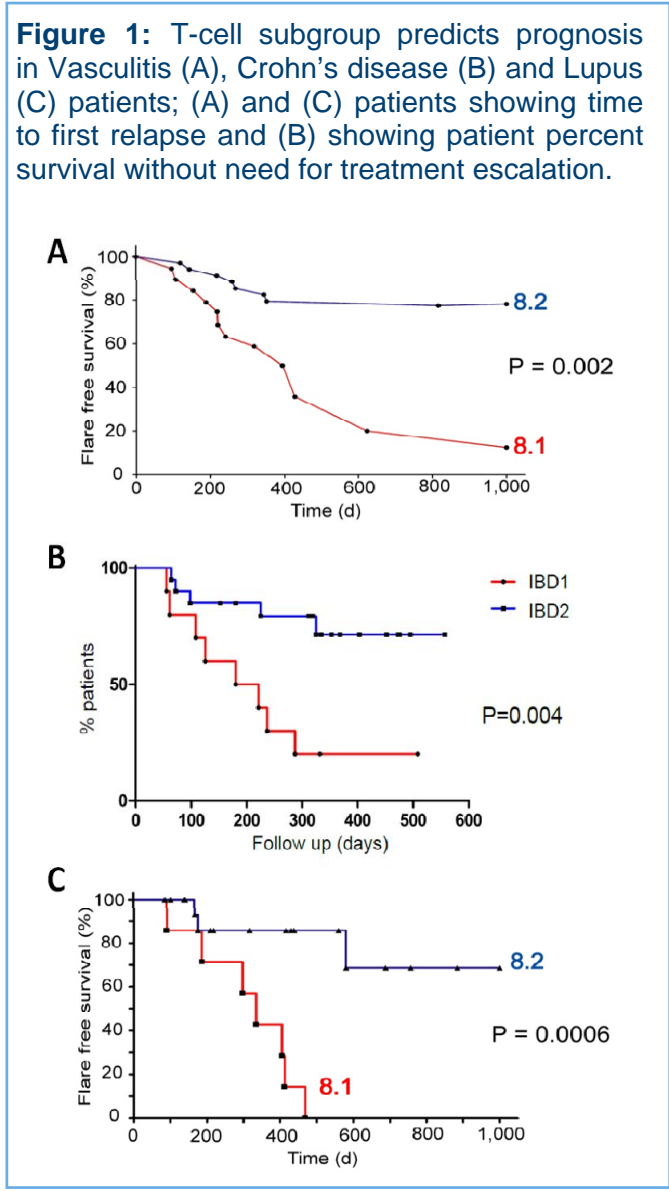
### Technology

Microarray analysis of purified white blood cell subsets (CD8 T-cells) has allowed the identification of differentially expressed genes in samples collected from Vasculitis (Fig 1, A), Inflammatory Bowel Disease (Fig 1, B) and Lupus (Fig 1, C). Patients fell into two distinct groups according to their CD8 expression profiles. Patients with Vasculitis and Lupus in the 8.1 subgroup were consistently at a higher risk of more frequent, multiple relapses, while the 8.2 subgroup demonstrated a low risk of relapse. Patients with Crohn’s disease and Ulcerative Colitis (data not shown) belonging to the IBD1 subgroup both experienced a significantly more aggressive disease course. The biomarker also identified renal transplant recipients with an increased risk of acute rejection (data not shown). The translation of this gene signature into a quantitative PCR-based assay not requiring cell separation is currently being investigated.

### Commercialisation

This technology may ultimately allow development of a test which predicts prognosis in autoimmune disease and which facilitates individualised therapy. Reliable identification of patients at a high risk of more aggressive disease progression may allow intensification of current therapy regimes or could support the targeted use of novel biological therapies for autoimmune disease.

We are seeking a commercial partner for licensing, collaboration and development of this technology, protected by patent PCT/GB2010/000085.



### Reference

McKinney E *et al* A CB8(+) T cell transcription signature predicts prognosis in autoimmune disease. *Nat Med* 2010, 586-591.