Scottish Nested Arthritis Progression cohort: Evaluation of the emerging cellular signatures within the blood of early rheumatoid arthritis patients

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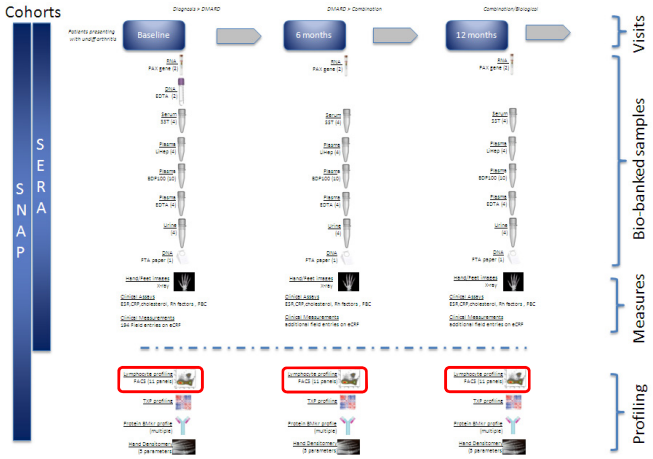
Aim/Purpose: Rheumatoid arthritis (RA) is a common, disabling disease for which there is no cure. Recent therapeutic advances have considerably improved outcomes. There is now an urgent need for biomarkers that define those patients with RA that will progress as compared with those that will either remit spontaneously or do so upon early therapeutic intervention. Using a nested patient cohort within the Scottish Early Rheumatoid Arthritis (SERA) inception cohort, we are seeking discrete, dynamic immunological profiles in cell subsets, plasma or serum, associated with important clinical outcomes. Baseline datasets are now available within which we can evaluate disease specific molecular signatures.

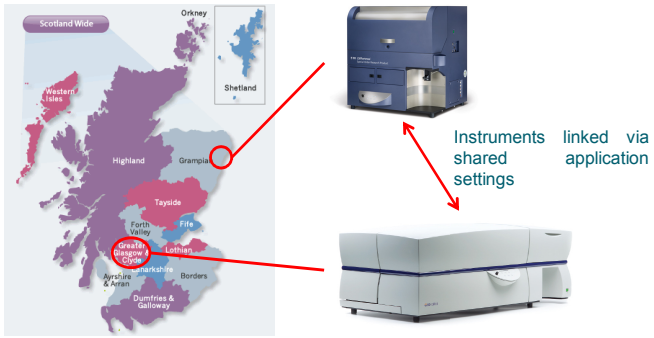
Methodology: Comprehensive clinical and laboratory data were collected from individuals recruited into the SNAP cohort of newly diagnosed RA (or undifferentiated arthritis with a high probability of progressing to RA using the Leiden prediction score) who commenced on methotrexate monotherapy (n=50). Blood samples from SNAP patients (n=50) and healthy controls (n=10) were examined by deep immuno-phenotyping using a multi-centre harmonized multi-parameter surface and intracellular flow cytometry protocol, which captures in excess of 488 sub-populations.

Results & conclusions: We have established a near patient flow cytometry multi-institute facility that can generate precise and reproducible datasets using

SNAP cohort – Analysis via deep immunophenotyping

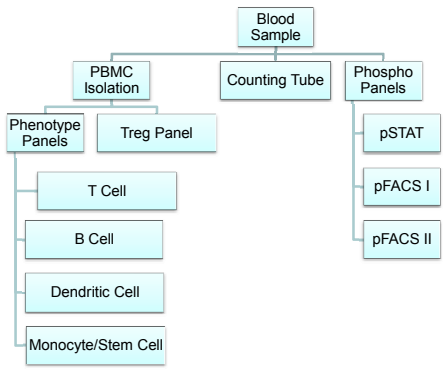


Two linked research centers: Harmonized flow cytometers to enable comparable data analysis of SNAP patients within two distinct NHS Scotland regions.



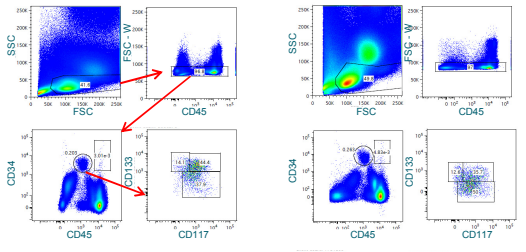
Quality controlled flow cytometric measurements. Standard operating procedures at both sites.

Deep immunophenotyping strategy.



Extensive validation of linked machines and immunophenotyping panels.

Monocyte / Stem cell panel



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Summary: Established a multi-center validated flow cytometry resource for the examination of the peripheral immune system in patients. Sixty patients have been recruited and processed over the two sites with 10 patients having returned for their 6 month follow up. Analysis of immuno-profiles is currently ongoing.

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