The BRASS registry began recruitment in March 2003 establishing a prospective observational cohort of 1,000 rheumatoid arthritis patients in order to:

• Determine and validate biomarkers that predict drug response and toxicity in rheumatoid arthritis.

• Determine and validate biomarkers that predict disease activity and progression in rheumatoid arthritis.

• Evaluate the natural history of treated rheumatoid arthritis by measuring clinical, functional and economic outcomes

BRASS has the ability to identify biomarkers of disease risk and disease progression
Pilot Study SNP Genotyping Results presented at the Keystone Conference 2004

RA risk: Symptom severity:

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Allele Freq</th>
<th>P-value (Fisher)</th>
<th>Odds Ratio</th>
<th>Gene</th>
<th>SNP</th>
<th>Allele Freq</th>
<th>P-value (ANOVA)</th>
<th>Odds Ratio</th>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNFa</td>
<td>308</td>
<td>9.5%</td>
<td>0.0041</td>
<td>0.40</td>
<td>SLC11A1</td>
<td>38</td>
<td>30.5%</td>
<td>0.0016</td>
<td>Swollen Joint Count</td>
<td></td>
</tr>
<tr>
<td>NkJI1L1</td>
<td>80</td>
<td>31.2%</td>
<td>0.025</td>
<td>1.55</td>
<td>SLC11A1</td>
<td>90</td>
<td>40.6%</td>
<td>0.0078</td>
<td>PGA Score</td>
<td></td>
</tr>
<tr>
<td>MMP3</td>
<td>55</td>
<td>49.3%</td>
<td>0.013</td>
<td>0.57</td>
<td>IL10</td>
<td>53</td>
<td>21.3%</td>
<td>0.0086</td>
<td>Tender Joint Count</td>
<td></td>
</tr>
<tr>
<td>IL4</td>
<td>12</td>
<td>12.2%</td>
<td>0.032</td>
<td>0.63</td>
<td>IL10</td>
<td>53</td>
<td>21.3%</td>
<td>0.0294</td>
<td>PGA Score</td>
<td></td>
</tr>
</tbody>
</table>

Abstracts/Publications:

• Contemporary Trends in Rheumatoid Arthritis Disease Activity Reduction and Medication Use, 341/PORTEIN

• Whole Genome Association Study of Quantitative CCP Titer in Rheumatoid Arthritis, 637/PORTEIN

• Biomarkers of Rheumatoid Arthritis Disease Activity: A Translational Approach, 551/ORAL PRESENTATION

• Association between ATIC, TPA, AMPPD1, MIF and MIFR Polymorphisms and Disease Activity in Rheumatoid Arthritis Patients on Methotrexate, 77/PORTEIN

• Can Pain Sensitivity SNPs be Replicated in Rheumatoid Arthritis Patients? 1064/ORAL PRESENTATION

• Beyond Fatigue and Pain: Addressing Concerns of Rheumatoid Arthritis Patients Outside of What is Traditionally Covered in the Physician Visit, Workshop, Abstract

• Evaluation of Selected Rheumatoid Arthritis Activity Scores for Office-Based Assessment, 1889/PORTEIN

• Whole Genome Association Study Identifies Rheumatoid Arthritis Risk Loci Near TNFAIP3, 2125/ORAL PRESENTATION

• Rheumatoid Arthritis Outcomes: Focus Groups Emphasize Lifestyle, Social and Self-image Effects of RA, 2187/ORAL PRESENTATION

• Two independent alleles at 4q33 associated with risk of rheumatoid arthritis, Plenge, RM, et al., Nature Genetics, 2007 Oct; [Epub ahead of print];


• Opposing effects of the D70 mutation and the shared epitope in HLA-DR4 on disease activity and certain disease phenotypes in rheumatoid arthritis. Shadick NA, et al., Ann Rheum Dis. 2007 May 21; [Epub ahead of print];


• Principal components analysis corrects for stratification in genome-wide association studies. Price AL, et al., Nature Genetics, 38(9):981-9, 2006 Aug

