



Market Sector:  
Pharmaceutical, Biomedical/Clinical diagnostics

## Means and methods for classifying samples of multiple sclerosis patients

### Market

Multiple sclerosis (MS) is a common inflammatory disease of the central nervous system characterized by progressive neurological dysfunction. No curative therapy is currently available, and the majority of affected individuals are ultimately disabled. In the USA, about 400.000 people have MS, and every week an additional 200 more are diagnosed. MS costs Americans \$9.5 billion in medical care and lost productivity each year. There is a positive correlation between the severity of the disease and the underlying costs of treatment.

Interferons (IFN, notably type I) are the most widely used as therapeutic treatments for MS. Clinical experience suggests however that there are IFN 'responders' as well as 'non responders'. Also, interferon is reported to have only limited benefit in relapsing-remitting and secondary progressive MS. Flu-like symptoms and injection site reactions are common. Cost per patient is  $\pm$  \$ 20.000 - \$ 40.000 per year. *There exists a clear need for the development of a biomarker that allows classifying cells according to a probability to respond to type I interferon.*

### Summary of invention

**The present invention provides a method for classifying cells from a human individual that are typically responsive to exposure to a type I interferon, determining a level of activity of a pathway that is modulated by type 1 interferon, and classifying such cells on the basis of the determined level of activity. This method was developed by a pharmacogenomics study identifying the gene expression ratio of some essential IFN-induced genes in a group of 16 Dutch patients with clinically definite relapsing intermittent MS. This analysis revealed that some patients showed upregulated genes, whereas in other patients the same genes were downregulated or unchanged after IFNbeta therapy. A number of IFN-induced genes clustered tightly together ( $r=0.925$ ) indicating a related function of these genes, but showed different differential relative response ratio's between patients. The expression data of some of the IFN-induced genes were validated by real time-PCR and showed a good correlation with the micro array data.**

### KEYWORDS

Multiple Sclerosis; interferon (IFN) therapy; biomarker; therapeutic effectiveness; IFN-induced

### KEY BENEFITS

First available biomarker based on essential gene sets predicting the efficacy of interferon therapy in multiple sclerosis

Novel gene set base to further develop a diagnostic method enabling a more rational therapeutic treatment for multiple sclerosis; minimal essential gene set

### PATENT / IP STATUS

The patent application has been filed October 2007

### CONTACT:

Miriam Leloux  
Valorisation Officer  
Genomics

Technology Transfer  
Office VU & VUmc

W&N gebouw  
De Boelelaan 1085,  
Kamer F-531  
1081 HV Amsterdam  
The Netherlands

T +31(0)20 598 9905  
F +31(0)20 598 9904  
E Leloux@tto.vu.nl



# OPPORTUNITY

## Applications

- A method for classifying human cells that are typically responsive to exposure to a type I interferon; this method is able to determine a level of activity of a pathway that is modulated by type 1 interferon; and classifying such cells on the basis of the determined level of activity.
- A kit comprising a set of probes or primers specific for RNA of a specific gene set for classifying a sample of an individual suffering from, or at risk of suffering from, multiple sclerosis.

## Commercial partner

- Type of partner sought: pharmaceutical or diagnostic company
- Specific area of activity of the partner: multiple sclerosis treatment or biomedical/clinical diagnostics in multiple sclerosis

## Remarks

Further information will be provided on the basis of a Non Disclosure Agreement

### KEYWORDS

Multiple Sclerosis; interferon (IFN) therapy; biomarker; therapeutic effectiveness; IFN-induced

### KEY BENEFITS

First available biomarker based on essential gene sets predicting the efficacy of interferon therapy in multiple sclerosis

Novel gene set base to further develop a diagnostic method enabling a more rational therapeutic treatment for multiple sclerosis; minimal essential gene set

### PATENT / IP STATUS

The patent application has been filed October 2007

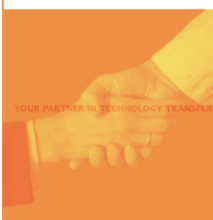
### CONTACT:

Miriam Leloux  
Valorisation Officer  
Genomics

Technology Transfer  
Office VU & VUmc

W&N gebouw  
De Boelelaan 1085,  
Kamer F-531  
1081 HV Amsterdam  
The Netherlands

T +31(0)20 598 9905  
F +31(0)20 598 9904  
E Leloux@tto.vu.nl



YOUR PARTNER IN TECHNOLOGY TRANSFER

Technology  
Transfer  
Office

VU University & Medical Center Amsterdam