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## PD-1 Inhibitor Screening

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### Background

The T cells response to infections is a result of a delicate balance between their effector functions, necessary to eliminate the pathogen, and their potential to cause tissue damage. Thus, regulatory molecules are crucial in maintaining the balance between an effective response and the development of autoimmune diseases. Among these molecules, PD-1 has shown to predominately mediate inhibitory signals towards T cells in order to avoid excessive activation of the immune response. PD-1 expression is upregulated on activated T cells including tumor specific killer cells and its ligand (PD-L1) is strongly expressed on various tumors. The interaction of PD-1 (present on tumor specific T cells) with its ligand PD-L1 (expressed on tumor cells) will inhibit the function of these T cells and will allow the tumor to escape the immune response. Therefore, PD-1 inhibition promises to be a major therapeutic breakthrough that might revert the immuno-compromised state of T cells. This will allow an increase in the efficacy of the immune response and therapies. Given this context, there is a need for the development of inhibitors which can target PD-1 and modify its associated processes.

### Technology

Dr. Rafick-Pierre Sekaly's research group has developed an assay to screen for PD-1 inhibitors, by measuring the functional impact of PD-1 blockade.

This invention is a simple assay that can be used to screen hundreds of thousands of molecules in order to identify an inhibitor of PD-1-mediated immune dysfunction; this would allow rescuing T cells from exhaustion.

The screening is accomplished by administration of the potential inhibitor to PD-1-activated cells and then comparing the obtained gene expression profile to that of non-treated cells.

### Results

The gene expression profile obtained from a test compound is compared with the untreated baseline expression profile. The resulting analysis then indicates whether the test compound causes inhibition of PD-1.

### Applications

This product can meet the commercial need of a screening tool for PD-1 inhibitors. Since the industry seeks to make its investments profitable, this excellent decisional tool becomes a major cost-saving instrument for a pharmaceutical society, through the elimination of all ineffective molecules from the *in vitro* phase.

### Competitive Advantages

To our knowledge, this method is the first simple assay that allows the high throughput screening of thousands of molecules to determine their PD-1 inhibitory capacity.

### Patent Status

PCT application filed (Q4/2008)

### Business Opportunity

Univalor is seeking a license agreement with a commercial partner.

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