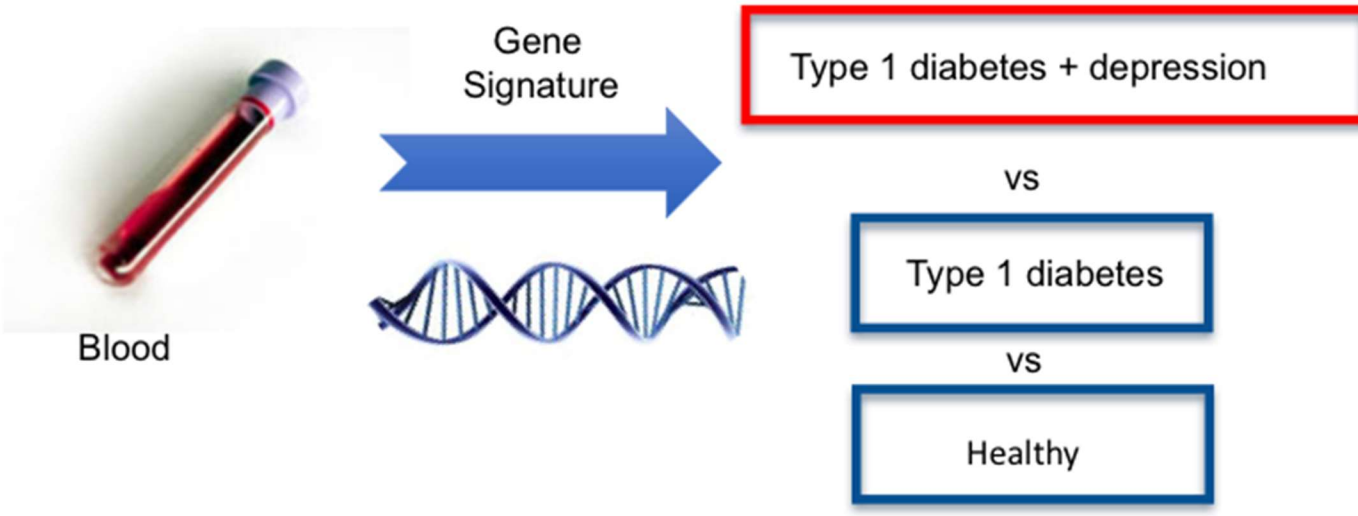
Update on 11-14-17

Recent studies show that patients with diabetes have a much higher likelihood of depression than the general population, and young people with type 1 diabetes (T1D) had 11 times the suicide rate. Our goal is to identify genetic signatures in white blood cells that distinguish non-progressor T1D patients and T1D patients that do progress to psychiatric illness.

We are conducting an unbiased search for changes in gene expression that are shared between T1D with depression T1D and healthy controls. From UMass Medical Center Biorepository we have obtained blood samples from 60 patients with T1D (20), T1D with depression (20) and healthy controls (20). We have isolated RNA from all of these samples and started library constructions. In order to find out what sequencing depth we will need, we have already sequenced one library from a healthy control patient. We were able to detect 17, 111 genes from which 1.9 million reads were successfully mapped to the human genome (20% efficiency). We will continue library constructions for the reminding human samples and perform sequencing in order to discover genetic biomarkers that identify T1D patients with susceptibility to depression, and vice versa, so that appropriate preventative measures can be taken. Our hope is to find a genetic association linking T1D and depression which will uncover mechanisms to improve therapies, even preventative ones, to alleviate suffering caused by both illnesses which are very common and extraordinarily costly—both in relation to healthcare, but also in regards to individual quality of life.



Update on 7/3/17

Our goal in this project is to identify genetic signatures in white blood cells that distinguish non-progressor T1D patients and T1D patients that do progress to depression. We have found that several neuronal proteins that are known to be

important for brain function show abnormal expression in beta cells from T1D compared to non-diabetic donors. Even though it has been well recognized that abnormal expression or autoantibodies to proteins such as GAD and IA2 are separately associated with risk of T1D OR mental disorders, there are no studies looking for the signature of these genes as a predictor of co-occurrence of mental disorders AND T1D.

In this project, I will be isolating RNA from the blood samples of matched healthy and T1D patients with and without depression. RNAseq will be performed to reveal genetic signature in this unbiased search for changes in gene expression that are shared between depression and T1D. Any identified targets will be verified by qPCR to validate the results. We are hoping to identify markers in the blood that can be used to screen T1D patients for their likelihood to progress to depression. This will allow a better intervention in the at-risk population to prevent comorbidity of depression and T1D.