# Detection of Human Papillomavirus (HPV) Immunoreactivity in Pancreas Tissues with Type-1 Diabetes

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## Introduction

Type-1 diabetes (T1D) is insulin-dependent diabetes mellitus (IDDM) caused by multiple environmental factors associated with a strong genetic predisposition. Virus infections is one of such environmental factors. Several viruses have been reported as possible triggers in human type-1 diabetes.

HPV is one the most common sexually transmitted infections worldwide, affecting 50-70% of sexually active individual. A very high percentage of cervical and anal cancers is caused by HPV infections. Vaccines against HPV have been proven to effectively protect against these HPV-associated cancers, and it has been introduced for female adolescents at age of 9-14 years old. While proven to be effective, some reports raised a concern on a possible link of this vaccine with pancreatis and T1D.

This project is to determine the presence of human papillomavirus (HPV) in pancreas tissue with T1D.

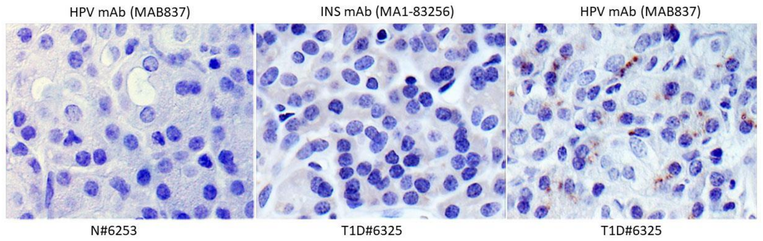
## Methods

Paraffin tissue sections of human pancreas from nPOD were stained by immunohistochemistry (ABC kit, Vector) with human papillomavirus (HPV) monoclonal antibody (MAB837,clone# 1H8 from EMD Millipore, specific to the major virus capsid protein L1) in conjunction with other islet cell markers (insulin and glucagon antibodies).

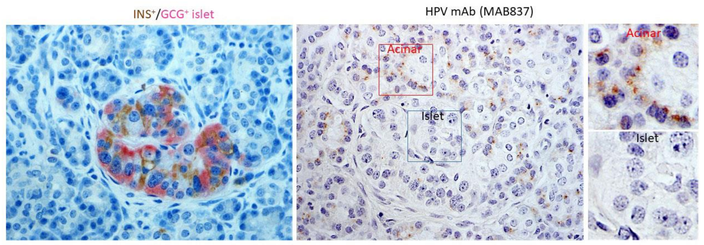
## Summary of Results

HPV L1 immunostaining were performed in pancreas tissues from 8 nondiabetic controls (N#6017, #6030, #6034, #6055, #6271, #6253, #6401, #6417) and 10 T1D patients (T1D#5000, #6035, #6045, #6046, #6299, #6325, #6405, #6469, #6477, #6480). We have found that HPV L1 immunoreactivity is present in pancreas tissues from **two** T1D patients (T1D#6235 and T1D#6045), but absent in all nondiabetic controls. The two HPV L1 positive T1D pancreas tissues show different immunostaining pattern: 1) in T1D#6235, the HPV L1 immunostaining is mainly present in exocrine acinar cells, absent in ductal cells and endocrine islet cells; 2) in T1D#6045, the HPV L1 immunostaining is mainly present in endocrine islet cells and ductal cells, absent in exocrine acinar cells.

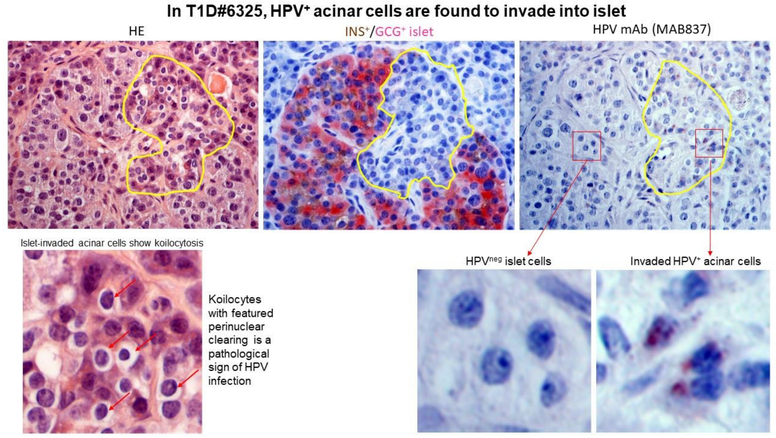
**Specific immunostaining of HPV mAb in pancreatic acinar cells of T1D#6325**



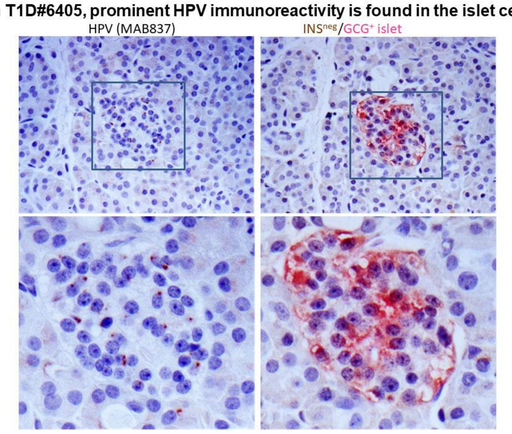

**In T1D#6325, HPV mAb (MAB837) staining is positive in acinar cell but negative in islet cells**




**In T1D#6325, HPV+ acinar cells are found to invade into islet**




**In T1D#6405, prominent HPV immunoreactivity is found in the islet cells**




## Conclusion

To our knowledge, this is the first report to show the presence of HPV L1 immunoreactivity in T1D pancreas tissues, which raised the question on whether the HPV virus plays a role in the pathogenesis of some cases of T1D. This observation may suggest HPV as a new virus candidates in pathogenesis of T1D. It may also implicates a beneficial role of early HPV vaccination to prevent T1D.

## References

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