

Patient-derived organoids (PDOs) to model nephroblastoma (Wilms tumour)

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Nephroblastoma (Wilms tumour)

Prevalence

- 4th most common pediatric cancer
- 40 – 50 new cases per year in Canada
- Primarily affects children under age of 5

Prognosis

- Favorable histology:
 - Accounts for ~90% of cases
 - Good outcomes after treatment
- Anaplastic (Unfavorable) histology:
 - The more aggressive form with higher rates of relapse
 - Aggressive treatment needed to improve outcomes

Podocalyxin (PODXL)

Podocalyxin in health and in cancer

- glycosylated, transmembrane sialomucin on apical surface of kidney podocytes
- maintains kidney glomerular filtration
- Upregulated in various human tumours
 - Independent predictor of poor prognosis

Targeting podocalyxin: Antibody epitopes

- mAb Podo83
 - Recognizes total PODXL including those in normal tissues
 - Suppresses growth and metastasis of breast and ovarian cancers
- mAb Podo447
 - Exquisitely recognizes a tumour-specific form of PODXL
 - Lacks reactivity to normal tissues
 - Podo447-drug conjugates available

Goal

Evaluating podocalyxin as a therapeutic biomarker for aggressive nephroblastoma

Objectives

- 1 Establish patient-derived organoids (PDOs) from cryo-preserved nephroblastoma tissues as the model system
- 2 Characterize the morphological and molecular features of nephroblastoma PDOs
- 3 Evaluate the expression of total and tumour-specific forms of podocalyxin (Podo83 and Podo447, respectively)

PDO as model system

Project timelines

