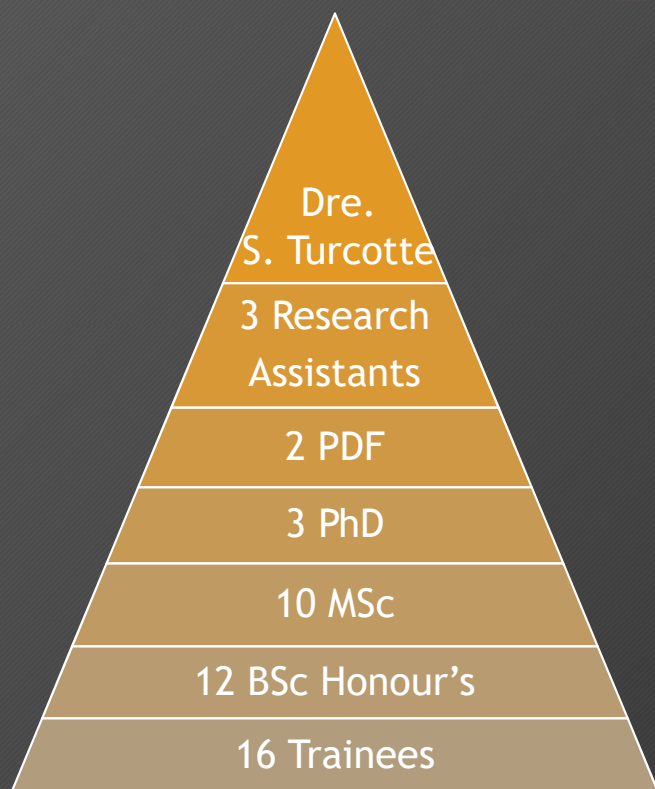


Dre. Sandra Turcotte

Canadian Cancer Society Research Chair 2011-2019



Canadian Cancer Society (Research Chair)	1.1 M
Canadian Institutes for Health Research (CIHR)	500 000
Kidney Foundation of Canada	100 000
Cancer Research Society	120 000
KRESCENT (CIHR-CSN-KFOC-NBHRF)	200 000
NBHRF	150 000
NBIF (start-up, Capacity Development)	70 000
Studentships (NBIF, NBHRF, U. de Moncton, Coop-SEED)	300 000
Total (2012-2018)	2 540 000

* Atlantic Innovation Foundation (2014-2018) 3M
Co-Applicant (team grant with ACRI))



Precision medicine in kidney cancer: Targeting lysosomes in aggressive tumors



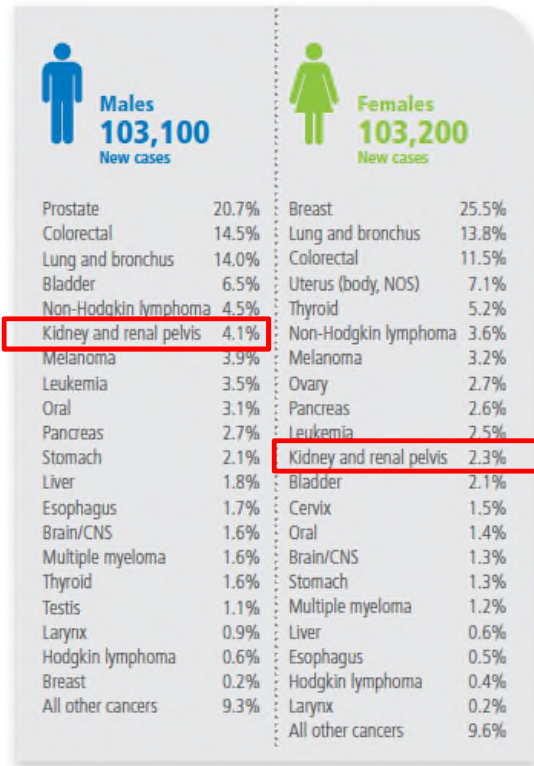
Sandra Turcotte, PhD

*Researcher in residency at ACRI
Associate Professor, Université de Moncton*

Kidney cancer in 2017



FIGURE 1.2 Percent distribution of projected new cancer cases, by sex, Canada, 2017

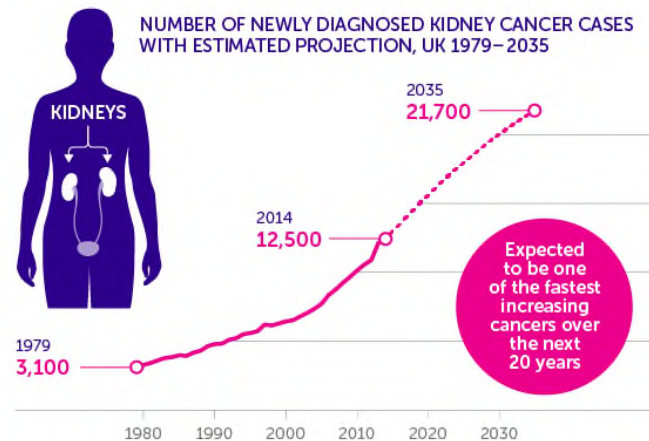


- Top ten of most common form of cancer diagnosed
- The average of age for diagnosis is 64 years old
- More in men than women
- Obesity, smoking and genetics are risk factors

Kidney cancer worldwide



RAPID RISE OF KIDNEY CANCER CASES EXPECTED TO CONTINUE



Source: cruk.org/cancerstats

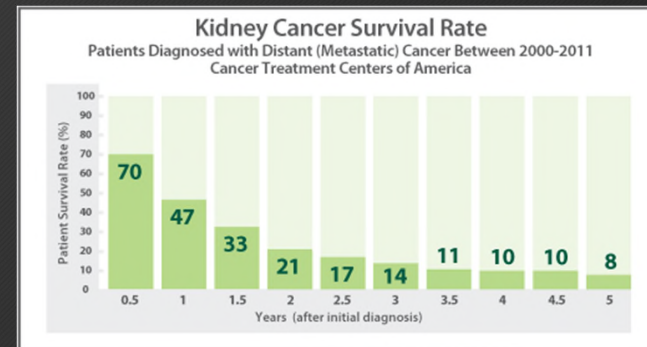
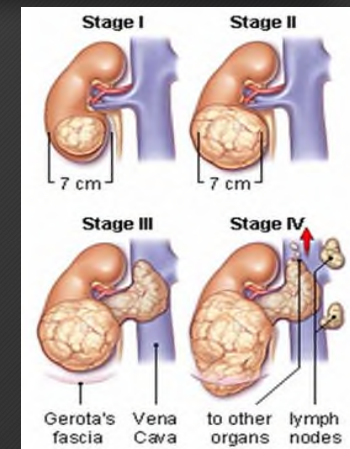
LET'S BEAT CANCER SOONER
cruk.org



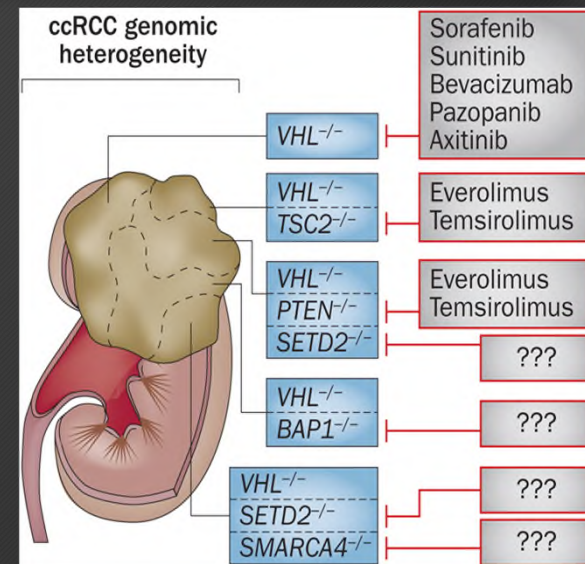
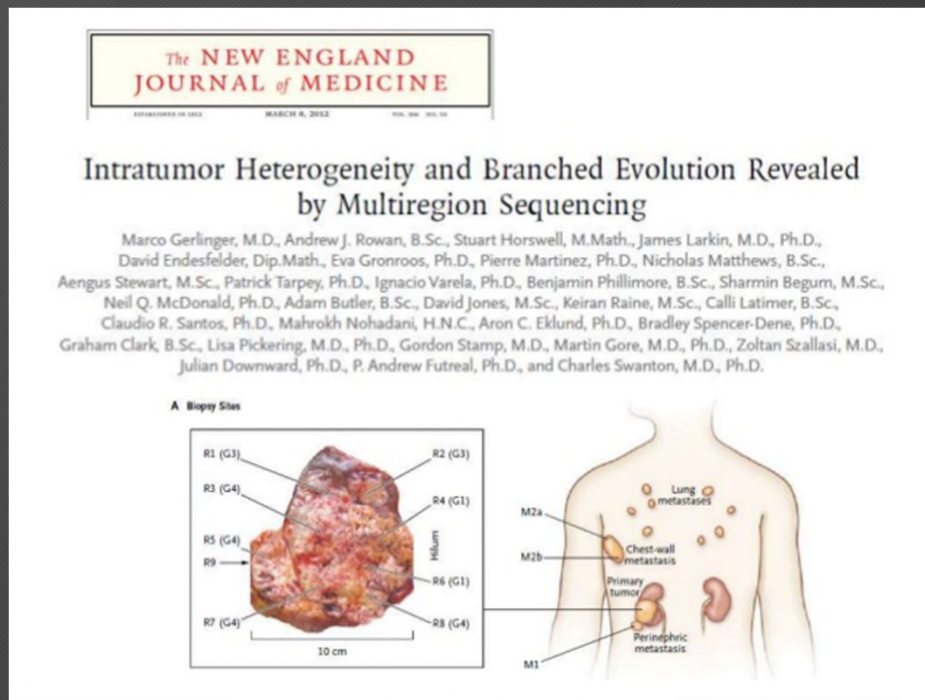
Kidney Cancer	# of people diagnosed	# of people dead
Worldwide	338,000	143,000
USA	63,920	13,860
Canada	6,600	1,900
N.-B	190	55

Renal Cell Carcinoma (RCC) 90% of diagnosis

- Asymptomatics (1/3 of patients have metastasis)
- No biomarker in routine clinical uses in RCC
- Highly vascular tumors resistant to therapies
- 5 year survival rate are about 10% for mRCC



High intratumor heterogeneity VHL is the only common mutation



Targeting VHL for development of new therapeutic

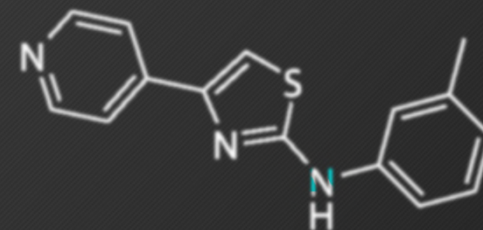
- Screening of small molecules toxic for VHL-mutated cells
- Concept of synthetic lethality

- **Identification of STF-62247**

(Turcotte et al. Cancer Cell 2008; Hay et al., J. Med. Chem 2010; Turcotte and Giaccia, Curr. Opinion in Cell Biol 2010).

- **Characterization of STF-62247**

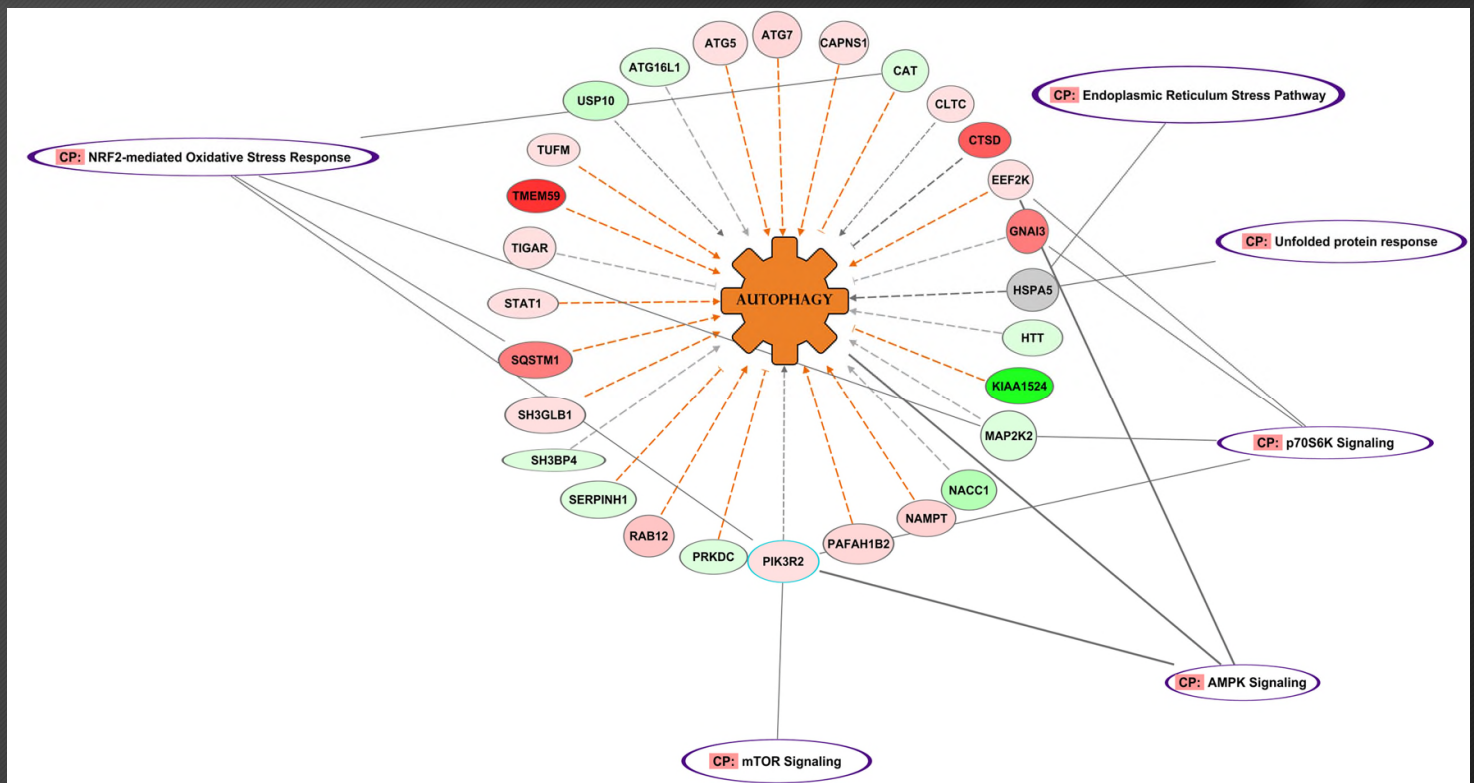
(Chan et al. Sci. Transl. Medicine 2011; Bouhamdani et al., Int. J. Cancer 2017; Bouhamdani et al., Am. J. Cell Physiol 2019; Bouhamdani et al., Autophagy in revision)



Autophagy is the most affected process

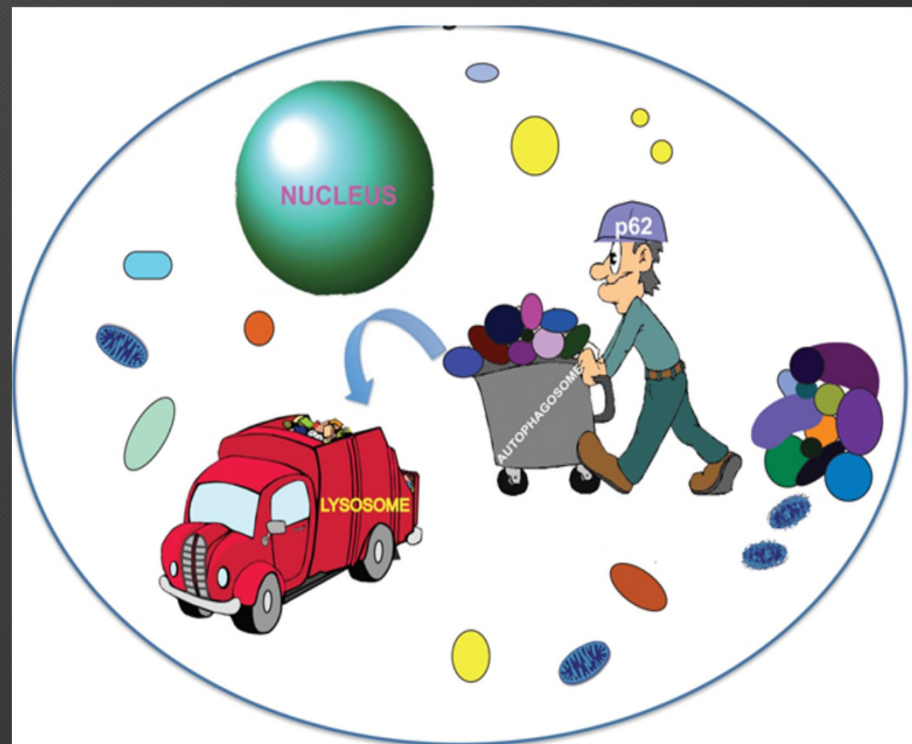
We found 755 proteins affected by the STF-62247. Most of them were involved in the autophagy-lysosome system.

Bouhamdani et al, Int. J of cancer 2017

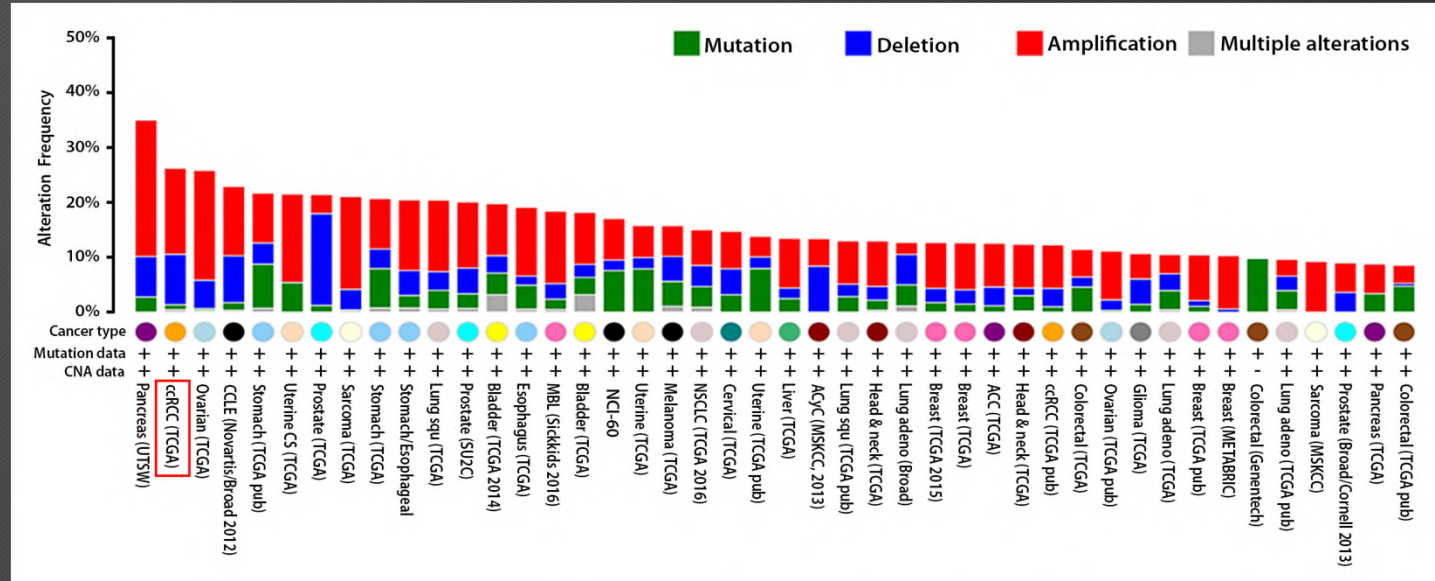


What is autophagy?

- Auto «self» phagy «eat»
- Lysosomal degradation process to remove misfolded proteins, aggregate or organelle
- Important for balancing sources of energy

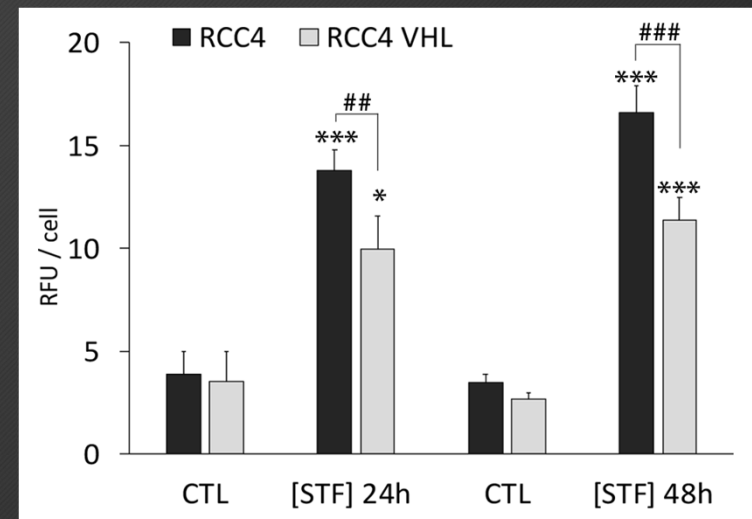
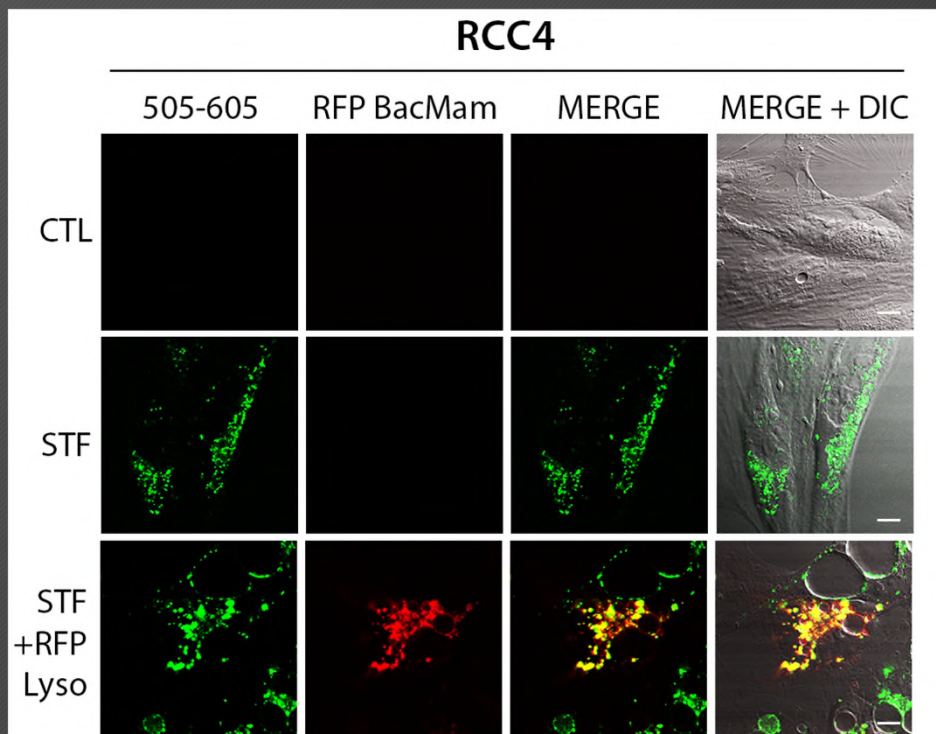


Alterations of lysosomal genes in 25% of patients with kidney cancer



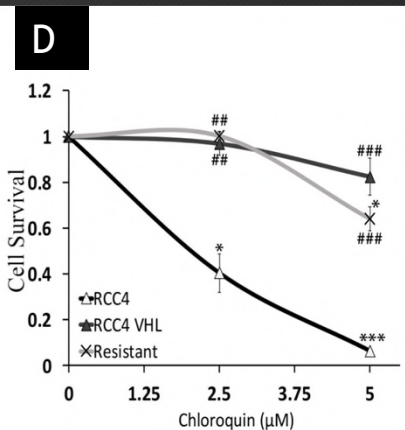
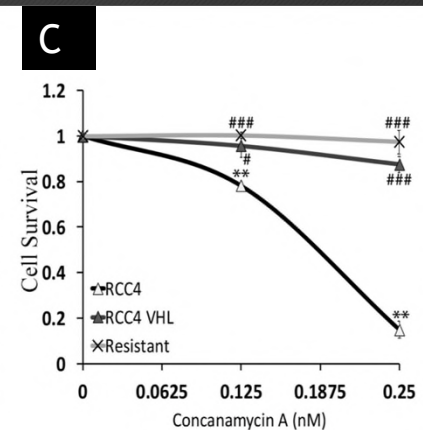
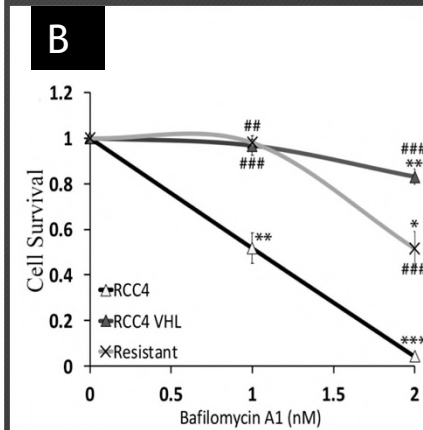
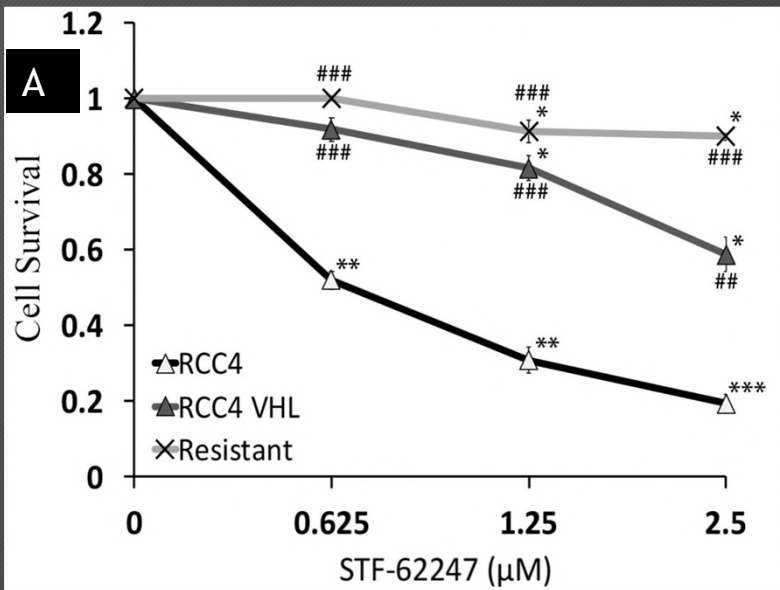
Bouhamdani et al., submitted to Autophagy

STF-62247 accumulates in lysosomes



Bouhamdani et al. AJP Cell Physiol. 2019

Lysosomal disrupting agents kill kidney cancer cells

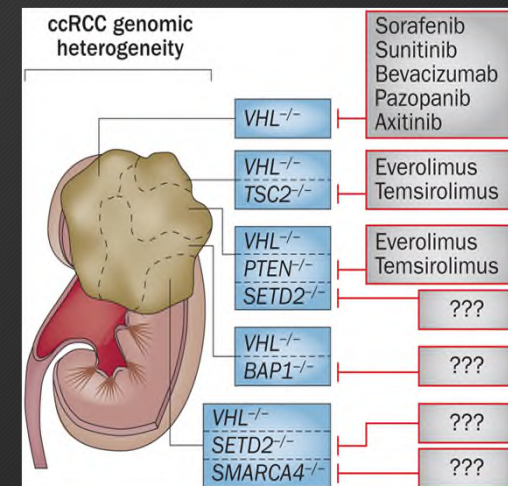


Agents perturbateurs des lysosomes

Bouhamdani et al., submitted to Autophagy

Taking advantage of lysosomal vulnerabilities for development of precision medicine in ccRCC

- Identification of STF-62247 target protein (CIHR funded)
- Using molecular biology to recreate mutation combination found during kidney cancer development (new project)
- Evaluate the potential of lysosomal disrupting agents to kill these specific mutations (CIHR funded, and new application)
- Identification and characterization of miR-2355 in kidney tumor development (KFOC and NBHRF funded)



Supervisory Activities

Research Assistant :

Sonia Dastous	2016/10-present
Pierre Lyons	2015/11-2017
Kevin Cormier	2011-2014

Postdoctoral studies (Principal Supervisor):

Ioanna Armata	2018/03-
Caroline Jose	2014/09- 2014/12

Doctorate (PhD) (Principal Supervisor):

Nadia Bouhamdani	2015/05-
Patric Page	2018/09-
Mathieu Johnson	2018/09-

Master in biochemistry (Principal Supervisor):

Patric Page	2017/09-2018
Mathieu Johnson	2016/09-2018
Dominique Comeau	2015/09-2018
Sonia Dastous	2014/09-2017/02
Sarah Robichaud	2014/09-2017/02
Maxime Cahuzac	2014/09-2016/12
Nadia Bouhamdani	2013/09-2015/05
Julie Reyjal	2011/09-2014/08

Master in Biochemistry (Co-Supervisor)

Guillaume Pelletier	2015/09-
Naoufal El Bekkouri	2014/09-

Undergraduate (Principal Supervisor):

Mathieu Sanschagrin	2018-2019
Sarah Richard	2017-2018
Patric Page	2016-2017
Alison Chiasson	2016-2017
Mathieu Johnson	2015-2016
Jean-Rémi Godin	2015-2016
	Summer 2015
Jessica Schrader	2014-2015
	summer 2014
Maxime Cahuzac	summer 2014
Sonia Dastous	summer 2014
	summer 2013
	2013-2014
Sarah Robichaud	summer 2014
	2013-2014
	summer 2013
Alexandre Coholan	2014-2015
	Summer 2013
	Summer 2012
Nadia Bouhamdani	2012-2013

Now, what you can do to help us???

- Continue to support health research in the province
- Promote scientists, infrastructure and building capacity
- Encourage collaborative approach between researchers and clinicians

Acknowledgements

Atlantic Cancer Research Institute

Université de Moncton



www.sandratuncotte.org

Turcotte cancer research group

