

**KEVIN ANTHONY HAY, MD MSc FRCPC**

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**Education & Credentials**

Postdoctoral Research Fellow, UBC Clinical Investigator Program <i>University of British Columbia / Fred Hutchison Cancer Research Center</i>	July 2016 – July 2018 (in progress)
FRCPC Fellowship Program in Clinical Haematology <i>University of British Columbia</i>	July 2014 – June 2016
FRCPC Residency Program in General Internal Medicine <i>University of British Columbia</i>	July 2011 – June 2014
MD Doctor of Medicine <i>University of Manitoba</i>	Sept 2007 – May 2011
MSc Master of Science in Immunology <i>University of Manitoba</i>	Aug 2005 – Feb 2008
BSc Bachelor of Science in Biology (Honors) and Chemistry <i>Trinity Western University</i>	Sept 1999 – Sept 2004

**Teaching Experience**

Science over Lunch, Lay Audience <i>Fred Hutchinson Cancer Research Center, Seattle, WA</i> Delivered an audience-engaging presentation on current research at the Fred Hutchinson Cancer Research Center into novel cancer immunotherapies.	May 2017
Workshop Tutor, Hematology <i>University of British Columbia, Vancouver, BC</i> Tutored two workshops for medical students at the university on approach to coagulopathy and hematologic malignancies.	Feb 2016
Lab Instructor, Organic and General Chemistry <i>Trinity Western University, Langley, BC</i> Weekly instruction of organic and general chemistry lab to first and second year undergraduate students, including marking and evaluating of student laboratory performance.	Sept 2002 – April 2004
Teaching Assistant, Advanced Physical and Environmental Chemistry <i>Trinity Western University, Langley, BC</i> Revision of laboratory experiments and laboratory manual during summer, and weekly supervision of environmental chemistry lab third and fourth year undergraduate students during the school year.	May 2002 – Apr 2003

**Research Experience**

Postdoctoral Research Fellowship	July 2016 – present
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*Fred Hutchinson Cancer Research Center, Seattle WA*

Supervisor: Dr. Cameron Turtle

Infusion of CD19-specific chimeric antigen receptor-modified T cells (CAR-T) has produced impressive antitumor responses in patients with refractory CD19<sup>+</sup> B cell malignancies, but is often associated with cytokine release syndrome (CRS). Our understanding of CRS continues to evolve, and identification of the kinetics of CRS and predictive clinical and laboratory biomarkers of severity are needed to evaluate strategies to mitigate toxicity. We have collected data from the phase I/II trial performed at our center in order to address this need, and preliminary results from this project have been presented at the American Society of Hematology 2016 and the American Society of Clinical Oncology (ASCO) 2017 annual meetings.

Internal Medicine Residency Research

Oct 2012 – June 2014

*British Columbia Cancer Agency, Vancouver, BC*

Supervisor: Dr. Diego Villa

Time to treatment from diagnosis (TDT) is a potentially controllable variable that could impact cure in some rapidly progressive diseases, such as diffuse large B cell lymphoma (DLBCL). We collected information on TDT in the setting of DLBCL in a retrospective study using the BC Lymphoid Malignancy Cancer Database and clinical databases available at the BC Cancer Agency, and determined that TDT >8 weeks was associated with decreased overall survival in a multivariate analysis. This data was presented in preliminary form at ASCO 2013 and subsequently published in *Leukemia and Lymphoma*.

Master in Immunology

Aug 2005 – Feb 2008

*National Microbiology Laboratory, Winnipeg, MB*

Severe acute respiratory syndrome coronavirus (SARS-CoV) is a rapidly lethal virus associated with acute respiratory distress syndrome (ARDS) that lead to a worldwide epidemic in 2003. We developed chimeric mouse-human monoclonal antibodies directed against SARS-CoV and characterized their binding affinity, site and neutralizing capacity. This data has been published in *mAbs*, as well as forming the basis of a master thesis defense.

### **Work Experience**

Locum Tenens, General Internal Medicine

Nov 2015 – Current

*Stanton Health Authority, Yellowknife, Northwest Territories*

Outpatient and inpatient internal medicine including follow up and new consults, electrocardiogram and Holter monitor readings, triaging of outpatient referrals, and review of incoming documents.

Locum Tenens, General Internal Medicine

Nov 2015 – Current

*Nanaimo Regional Hospital, Nanaimo, British Columbia*

Outpatient and inpatient internal medicine including follow up and new consults and electrocardiogram and Holter monitor readings.

### **Honours and Awards**

Best Overall, Poster Presentation Session

June 2017

*University of British Columbia Clinical Investigator Program Research Day 2017*

2<sup>nd</sup> Place, Poster Presentation Session

March 2017

*Canadian Conference on Lymphoproliferative Disorders (CCOLD) 2017*

Clinical Investigator Program Fellowship Recipient

July 2016 – June 2018

*University of British Columbia, Faculty of Medicine*

Best Overall Paper

March 2008

Dr. E.J. Bennett Entrance Scholarship <i>University of Manitoba, Faculty of Medicine</i>	August 2007
Postgraduate Scholarship <i>Natural Sciences and Engineering Research Council (NSERC)</i>	August 2005 – August 2007
Undergraduate Student Research Award <i>NSERC</i>	May 2003
Kenneth J. & Lillian M. Voller Carlson Scholarship <i>Trinity Western University</i>	September 2001 – April 2003
Governor General's Award of Canada, Bronze	June 1999

### Professional Association Memberships

Doctors of BC	since July 2011
Canadian Medical Association	since July 2011
College of the Physicians and Surgeons of BC	since July 2011
American Society of Hematology	since July 2014
American Society of Clinical Oncology	since May 2013

### Publications

1. Turtle CJ, **Hay KA**, Hanafi L-A, Li D, Cherian S, Chen X, Wood B, Lozanski A, Byrd JC, Heimfeld S, Riddell SR, Maloney DG. Durable Molecular Remissions in Chronic Lymphocytic Leukemia Treated With CD19-Specific Chimeric Antigen Receptor–Modified T Cells After Failure of Ibrutinib. *JCO*. 2017;JCO.2017.72.851.
2. **Hay KA**, Turtle CJ. Chimeric Antigen Receptor (CAR) T Cells: Lessons Learned from Targeting of CD19 in B-Cell Malignancies. *Drugs*. 2017;77(3):237–245.
3. **Hay KA**, Lee B, Goktepe O, Connors JM, Sehn LH, Savage KJ, Shenkier T, Klasa R, Gerrie A, Villa D. Impact of time from diagnosis to initiation of curative chemotherapy on survival of patients with diffuse large B-cell lymphoma. *Leukemia and Lymphoma*, posted online June 19, 2015.
4. Lee B, Goktepe O, **Hay K**, Connors JM, Sehn LH, Savage KJ, Shenkier T, Klasa R, Gerrie A, Villa, D. Effect of place of residence and treatment on survival outcomes in patients with diffuse large B-cell lymphoma in British Columbia. *Oncologist* [Internet]. AlphaMed Press; 2014 Mar;19(3):283–90.
5. Berry JD, **Hay KA**, Rini JM, Yu M, Wang L, Plummer FA, Corbett CR, Andonov A. Neutralizing epitopes of the SARS-CoV S-protein cluster independent of repertoire, antigen structure or mAb technology. *MAbs* 2010 Jan;2(1):53-66.

### Abstracts / Presentations

1. Turtle CJ, **Hay KA\***, Gust J, Hanafi L-A, Li D, Liles WC, et al. Cytokine release syndrome (CRS) and neurotoxicity (NT) after CD19-specific chimeric antigen receptor- (CAR-) modified T cells. *JCO*. American Society of Clinical Oncology; 2017 May 20;35(15\_suppl):3020. Poster Discussion, ACSO Chicago 2017. \*presenting author
2. Turtle CJ, **Hay KA**, Juliane G, Hanafi L-A, Li D, Chaney C, Heimfeld S, Riddell SR, Maloney DG . Biomarkers of Cytokine Release Syndrome and Neurotoxicity after CD19 CAR-T Cells and Mitigation of Toxicity By Cell Dose. *Blood*. 2016;128(22):1852. Poster Presentation, ASH San Diego 2016.
3. Turtle CJ, Hanafi L, Berger C, Gooley T, Chaney C, Cherian S, Soma L, Chen X, Yeung CCS, Loeb K, Wood BL, Hudecek M, Sommermeyer D, Li D, **Hay KA**, Heimfeld S, Riddell SR, Maloney DG. High rate of durable complete response

rate in ALL, NHL and CLL after immunotherapy with optimized lymphodepletion and defined composition CD19 CAR-T cells. Oral Presentation, ASCO Chicago 2016.

4. **Hay KA**, Lee B, Goktepe O, Connors JM, Sehn LH, Savage KJ, Shenkier T, Klasa R, Villa D. Impact of time from diagnosis to initiation of curative chemotherapy on survival of patients with diffuse large B-cell lymphoma. Poster Presentation, ASCO Chicago 2013.
5. **Hay KA**, Corbett C, Rini J, Andonov A, Plummer F, Berry JD. Development and Characterization of a Neutralizing anti-SARS-CoV Spike Chimeric Mouse-Human Antibody. Poster Presentation, PepTalk San Diego 2007.

#### Invited Presentations

1. **Hay KA**. Can CAR-T cell therapy cure CLL? Oral Presentation, Chronic Lymphocytic Leukemia Expert Forum Dallas 2017.

#### Patents/Patent Applications

1. Howell, Jon Lee; **Hay, Kevin Anthony**. *Fluoro derivative-substituted aryl pnictogens and their oxides*. US Patent 7,569,527 August 4, 2009.
2. Howell, Jon Lee; **Hay, Kevin Anthony**. *Process for fluoro derivative-substituted aryl pnictogens and their oxides*. US Patent 7,420,074 September 2, 2008.
3. Friesen, Chadron Mark; **Hay, Kevin Anthony**, Daryl Nyvall, Jon L. Howell *Insulated perfluoropolyalkylether (PFPAE) alcohols*. US Pat. Appl. 20080033216.

#### Other Publications

1. **Hay, Kevin Anthony**. *Development and Characterisation of Neutralising Mouse-Human Chimeric Anti-SARS-CoV Monoclonal Antibodies*. MSc Thesis. University of Manitoba, Winnipeg 2008.
2. **Hay, Kevin Anthony**. "Hildegard's Medicine: A Systematic Science of Medieval Europe" *The Proceedings of the 17<sup>th</sup> Annual History of Medicine Days*. University of Calgary, Calgary 2008. pp. 147-152.