CMD 18-H4.52A

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Supplementary Information

Renseignements supplémentaires

Presentation from the Northern Ontario School of Medicine Présentation de Northern Ontario School of medicine

In the Matter of

À l'égard de

Bruce Power Inc. – Bruce A and B Nuclear Generating Station Bruce Power Inc. - Centrale nucléaire de Bruce A et Bruce B

Request for a ten-year renewal of its Nuclear Power Reactor Operating Licence for the Bruce A and B Nuclear Generating Station Demande de renouvellement, pour une période de dix ans, de son permis d'exploitation d'un réacteur nucléaire de puissance à la centrale nucléaire de Bruce A et Bruce B

Commission Public Hearing – Part 2

Audience publique de la Commission – Partie 2

May 28-31, 2018

28-31 mai 2018





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Intervention 2018-H-02: Bruce Power license renewal for Bruce A and B Nuclear Generating Stations

Dr. T.C. Tai Professor

Dr. Christopher Thome Post-Doctoral Fellow

NOSM/Laurentian University



Disclosure

The statements contained in this presentation may not reflect the opinion of NOSM but that of the low dose radiation researchers and collaborators at NOSM.



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BP-CHER Program

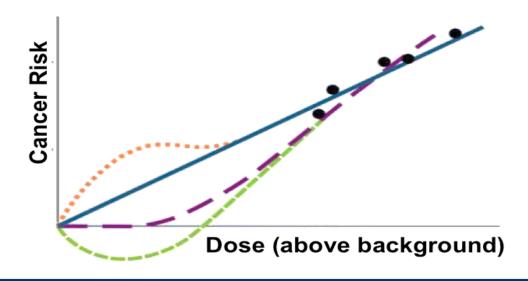
- Bruce Power funds: \$6,068,129
- Government grants:\$2,230,000
- 10 university faculty
- 28 HQP trained
- Non-biased research
 - Leveraged funding
 - Peer-reviewed data





Research

- Biological effects of low-dose radiation exposure (<100 mGy)
- Overall, our data do not support the current LNT model of risk





Fetal Programming

- Concept that links environmental conditions during fetal development with risk of disease later in life
- Relationship between low birth weight and risk of development of chronic adult life illness (cardiovascular diseases, metabolic syndrome, behavioural disorders)



Fetal Programming

- Animal Model: C57BL/6J6, BALB/C
- LDIR Exposure during last trimester (0-1000 mGy; 9.1 mGy/min)
- Physiological and Behavioral Analysis (16-18 wks):
 - Cardiovascular (blood pressure, heart rate)
 - Metabolism (glucose, lipid)
 - Behaviour (general anxiety, social anxiety, depression)
- Genetic and Biochemical Analysis



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SNOLAB

- Effects of sub-natural background radiation exposure
 - Growth
 - DNA damage
 - Carcinogenesis







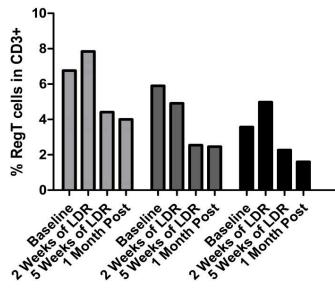


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Low-dose Radiation Therapy

- Half body low-dose irradiation to stimulate immune function
- 10 fractions of 150 mGy over 5 weeks







Radiation Cataracts

 New annual dose recommendation of 20 mSv



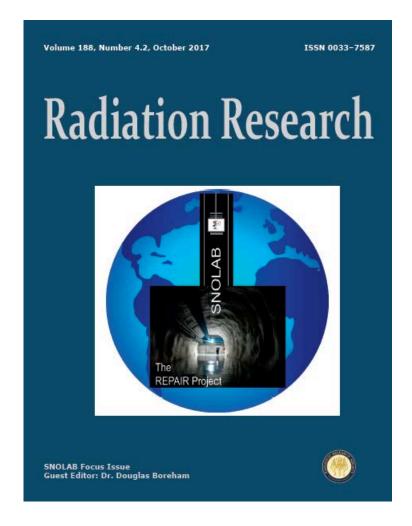
- Cataract rates following CT scans
- Laboratory studies on mechanisms





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Publications





Northern Ontario School of Medicine École de médecine

۲_{~۱۵}۰٫ ∇ ۲_°۰۰, ۲ ۱۰۵۰, ۲۰۵۰, ۲۰۵۶

du Nord de l'Ontario

Publications

-Review Paper-----

DETERMINISTIC EFFECTS TO THE LENS OF THE EYE FOLLOWING IONIZING RADIATION EXPOSURE: IS THERE EVIDENCE TO SUPPORT A REDUCTION IN THRESHOLD DOSE?

Christopher Thome *† Douglas R. Chambers † Antony M. Hooker &

REVIEW

Ionizing Radiation Exposure During Pregnancy: Effects on Postnatal Development and Life

Shayenthiran Sreetharan,^{a,1} Christopher Thome,^{c,1} Sujeenthar Tharmalingam,^{c,1} Devon E. Jones,^a Adomas V. Kulesza,^{a,1} Neelam Khaper,^d Simon J. Lees,^d Joanna Y. Wilson,^a Douglas R. Boreham^{b,c} and T. C. Tai^{c,2}

Departments of * Biology and * Medical Physics and Applied Radiation Sciences, McMaster University, Hamilton, Canada; * Division of Medical Sciences, Northern Ontario School of Medicine, Laurentian University, Sudbury, Canada; and * Division of Medical Sciences, Northern Ontario School of Medicine, Lakehead University, Thunder Bay, Canada





Article

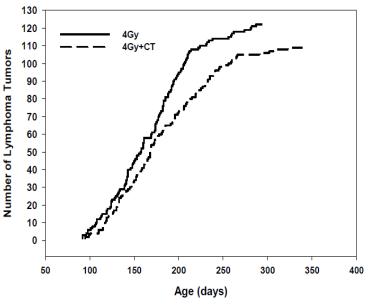
The Role of Radiation Induced Injury on Lung Cancer

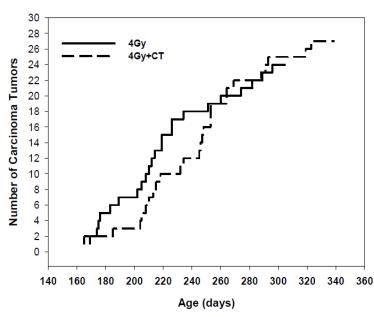
Stephanie Puukila ^{1,2,*}, Christopher Thome ^{1,2}, Antone L. Brooks ³, Gayle Woloschak ⁴ and Douglas R. Boreham ^{1,2,5}



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Low-dose Exposure

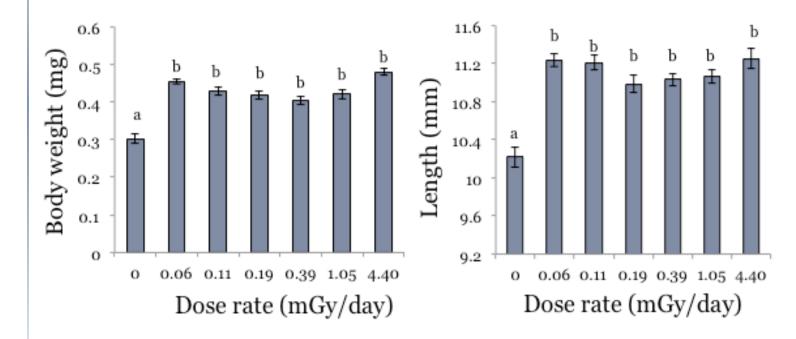




Lemon et al 2018 Radiat Res



Low-dose Exposure



Thome et al 2018 Radiat Res



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Outreach

March Break and Summer STEM camps: Grades 3 - 7





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Questions

