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## BME People

# Owen J.T. McCarty

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### Current Appointments

Assistant Professor, Department of Biomedical Engineering

Assistant Professor, Department of Cell & Development Biology

### Office

*Center for Health and Healing*

3303 SW Bond Avenue

Mail code: CH13B

Rm #13033

### Education

BS, Chemical Engineering, State University of New York at Buffalo, 1997

Ph.D, Chemical & Biomolecular Engineering, Johns Hopkins University, 2002

### Department(s)

*Biomedical Engineering*

### Biography

Dr. McCarty received his Ph.D in Chemical & Biomolecular Engineering from Johns Hopkins University with dissertation work focused on the role of platelets in cancer metastasis and thrombosis. As a Wellcome Trust Postdoctoral Fellow, he continued his research in the area of thrombosis, examining the signaling pathways governing platelet cytoskeletal reorganization, at the Department of Pharmacology, Oxford University and Centre for Cardiovascular Sciences, University of Birmingham, UK.

### Research Interests

Dr. McCarty's research is focused on understanding the interplay between cell biology and fluid mechanics in the cardiovascular system. In particular, his research into the balance between hydrodynamic shear forces and chemical adhesive interactions has great relevance to underlying processes of cancer, cardiovascular disease, and inflammation.

### Research Project(s)

*Thrombosis and Hemostasis*

### Research Group(s)

*Cardiovascular and Blood Research*

### Selected Publications

29. Tucker EI, Marzec UM, White TC, Hurst S, Rugonyi S, McCarty OJ, Gailani D, Gruber A, Hanson SR. Prevention of vascular graft occlusion and thrombus-associated thrombin generation by inhibition of factor XI, *Blood* 2008 OCT 22. [Epub ahead of print]

28. Vartanian KB, Kirkpatrick SJ, McCarty OJ, Vu TQ, Hanson SR, Hinds MT. Progenitor and carotid endothelial cells elongated on micropatterned surfaces exhibit distinct and shape-dependent



27. Lovely RS, Rein CM, White TC, Jouihan SA, Boshkov LK, Bakke AC, McCarty OJ, Farrell DH. GammaA/gamma' fibrinogen inhibits thrombin-induced platelet aggregation. *Thrombosis and Haemostasis* 2008 Nov; 100(5):837-846.
26. Calaminus SDJ, Thomas S, McCarty OJ, Machesky LM, Watson SP. Identification of a novel, actin-rich structure, the actin nodule, in the early stage of platelet spreading. *Journal of Thrombosis and Haemostasis* Nov; 6(11):1944-52.
25. White TC, Bery MA, Tucker EI, Urbanus RT, de Groot PG, Fernandez JA, Griffin JH, Gruber A, McCarty OJ. Protein C supports platelet binding and activation under flow: role of glycoprotein Ib and apolipoprotein E receptor 2. *Journal of Thrombosis and Haemostasis* 2008 Jun; 6(6): 995-1002. (Cover)
24. Markway BD, McCarty OJ, Marzec UM, Courtman DW, Hanson SR, Hinds MT. Capture of flowing endothelial cells using surface-immobilized anti-kinase insert domain antibody. *Tissue Engineering Part C* 2008 Jun; 14(2):97-105. (In Focus article)
23. Bery MA, White TC, Tucker EI, Bush-Pelc LA, Di Cera E, Gruber A, McCarty OJ. The thrombin mutant W215A/E217A acts as a platelet GPIb antagonist. *Arterioscler Thromb & Vasc Biol.* 2008 Feb;28(2):329-34. (Featured article)
22. Calaminus SDJ, Auger JM, McCarty OJ, Wakelam MJO, Machesky LM, Watson SP. MyosinIIa contractility is required for maintenance of platelet structure during spreading on collagen and contributes to thrombus stability. *Journal of Thrombosis and Haemostasis* 2007 Oct; 5(10): 2136-45. (Paper of the year)
21. Gruber A, Marzec U, Bush L, Di Cera E, Fernandez JA, Bery MA, Tucker EI, McCarty OJ, Griffin JH, Hanson SR. Relative antithrombotic and antihemostatic effects of protein C activator versus low molecular weight heparin in primates. *Blood* 2007 May 1; 109(9): 3733-40.
20. White TC, Bery MA, Robinson DK, Yin H, DeGrado WF, Hanson SR, McCarty OJ. The leech product saratin is a potent inhibitor platelet integrin  $\alpha 2\beta 1$  and von Willebrand factor binding to collagen. *FEBS Journal* 2007 Mar; 274(6): 1481-1492.
19. McCarty OJ,\* Calaminus SDJ,\* Auger JM, Insall RH, Watson SP, Machesky LM. A major role for Scar/WAVE-1 downstream of GPVI in platelets. *Journal of Thrombosis and Haemostasis* 2007 Mar; 5(3): 537-43.
18. Dhanjal TS, Ross EA, Auger JM, McCarty OJ, Hughes CE, Senis YA, Buckley CD, Watson SP. Minimal regulation of platelet activity by PECAM-1. *Platelets* 2007 Feb; 18(1): 56-67.
17. Hughan SC, Hughes CE, McCarty OJ, Schweighoffer E, Soultanova I, Ware J, Tybulewicz VLJ, Watson SP. GPVI-potential of platelet activation by thrombin and adhesion molecules independent of Src kinases and Syk. *Arterioscler Thromb & Vasc Biol.* 2007; 27:422-429.
16. Pearce AC, McCarty OJ, Calaminus SDJ, Vigorito E, Turner M, Watson SP. Vav family proteins are required for optimal regulation of the PLC $\gamma 2$  by integrin  $\alpha \text{IIb}\beta 3$ . *Biochemical Journal* 2007; 401: 753-761.
15. Thornber K, McCarty OJ, Watson SP, Pears CJ. Distinct but critical roles for integrin  $\alpha \text{IIb}\beta 3$  in platelet spreading on fibrinogen, collagen-related peptide and thrombin. *FEBS Journal* 2006 Nov 15; 273(22): 5032-5043.
14. McCarty OJ, Calaminus SDJ, Berndt MC, Machesky LM, Watson SP. VWF mediates platelet spreading through GPIb and  $\alpha \text{IIb}\beta 3$  in the presence of botrocetin and ristocetin, respectively. *Journal of Thrombosis and Haemostasis* 2006 Jun; 4(6): 1367-78.
13. Inoue O, Suzuki-Inoue K, McCarty OJ, Moroi M, Ruggeri ZM, Kunicki TJ, Ozaki Y, Watson SP. Laminin stimulates spreading of platelets through integrin  $\alpha 6\beta 1$ -dependent activation of GPVI. *Blood* 2006 Feb 15; 107(4): 1405-12.
12. McCarty OJ, Larson M, Auger JM, Atkinson BT, Kalia N, Pearce AC, Ruf S, Henderson, Tybulewicz V, Machesky LM, Watson SP. Rac1 is essential for platelet lamellipodia formation and aggregate stability under flow. *Journal of Biological Chemistry* 2005 Nov; 280(47): 39474-39484.
11. Watson SP, Auger JM, McCarty OJ, Pearce AC. GPVI and integrin  $\alpha \text{IIb}\beta 3$  signaling in platelets. *Journal of Thrombosis and Haemostasis* 2005 Aug; 3(8): 1752-62.
10. Ahn KC,\* Jun A,\* Pawar P, Jadhav S, Napier S, McCarty OJ, Konstantopoulos K. Preferential binding

of platelets to monocytes over neutrophils under flow. *Biochemical and Biophysical Research Communications* 2005 Apr 1; 329(1): 345-355.

9. McCarty OJ, Zhao Y, Andrew N, Machesky LM, Staunton D, Frampton J, Watson SP. Evaluation of the role of platelet integrins in fibronectin-dependent spreading and adhesion. *Journal of Thrombosis and Haemostasis* 2004 Oct; 2: 1823-1833.

8. McCarty OJ, Abulencia JP, Mousa SA, Konstantopoulos K. Evaluation of platelet antagonists in in-vitro flow models of thrombosis. *Methods of Molecular Medicine* 2004; 93: 21-34.

7. McCarty OJ,\* Hanley W,\* Jadhav S, Tseng Y, Wirtz D, Konstantopoulos K. Single-molecule characterization of P-selectin/ligand binding. *Journal of Biological Chemistry* 2003 Mar 21; 278(12): 10556-61. \*denotes equally contributing authors

6. McCarty OJ, Tien N, Bochner BS, Konstantopoulos K. Exogenous eosinophil activation converts PSGL-1-dependent binding to CD18-dependent stable adhesion to platelets in shear flow. *American Journal of Physiology: Cell Physiology* 2003 May; 284(5): C1223-34.

5. McCarty OJ, Jadhav S, Burdick MM, Bell WR, Konstantopoulos K. Fluid shear regulates the kinetics and molecular mechanisms of activation-dependent platelet binding to colon carcinoma cells. *Biophysical Journal* 2002 Aug; 83(2): 836-48.

4. Mousa SA, Abulencia JP, McCarty OJ, Turner NA, Konstantopoulos K. Comparative efficacy between the GPIIb/IIIa antagonists, roxifiban and orbofiban, in inhibiting platelet function in flow models of thrombosis. *Journal of Cardiovascular Pharmacology* 2002 Apr; 39(4): 552-5560.

3. Abulencia JP, Tien N, McCarty OJ, Plymire D, Mousa SA, Konstantopoulos K. Comparative antiplatelet efficacy of a novel nonpeptide GPIIb/IIIa antagonist (XV454) and abciximab (c7E3) in flow models of thrombosis. *Arterioscler Thromb & Vasc Biol.* 2001 Jan; 21(1): 149-156.

2. Burdick MM, McCarty OJ, Jadhav S, Konstantopoulos K. Cell-cell interactions in inflammation and cancer metastasis. *IEEE Engineering in Medicine and Biology* 2001 May; 20(3): 86-91.

1. McCarty OJ, Mousa SA, Bray PF, Konstantopoulos K. Immobilized platelets support human colon carcinoma cell tethering, rolling and firm adhesion under dynamic flow conditions. *BLOOD* 2000 Sep 1; 96(5): 1789-1797.

\*denotes equally contributing authors

#### Event Speaker

*Owen McCarty: The Elegant Platelet And A Sticky Situation In The Blood*

#### PhD Student(s)

Tara C. White-Adams, Michelle A. Berny, Robert Conley

#### Current and Upcoming Classes (through Spring 2009)

Class Number	CRN	Title	Term
BME 507	32146	Biomedical Engineering Seminar	Spring 2009
BME 607	32147	Biomedical Engineering Seminar	Spring 2009



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