



# Research Reporter

Scholarly, research and creative activity

Brock University

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## A Great Start to a Great Year!

On August 27th, the Office of Research Services hosted a new faculty orientation, at which 35 new faculty members attended. This annual event focuses on familiarizing Brock's new faculty to the many opportunities for external research funding and to the services offered by ORS. It also provides new faculty members with the opportunity to meet other colleagues, to learn about their research interests, and to build networks for future collaboration in research and teaching. The resource package provided to our new colleagues is available at [www.brocku.ca/researchservices/newfacultyorientation.html](http://www.brocku.ca/researchservices/newfacultyorientation.html).

The Office of Research Services has initiated two new publications: *New Faculty Directory (2003-04)* which highlights the research interests of our new colleagues and *Show Me The Money: Research Funding News*. The latter profiles research funding opportunities and provides advice from successful grant recipients on grant writing. See [www.brocku.ca/researchservices/researchcommunications.html](http://www.brocku.ca/researchservices/researchcommunications.html).

Research Services is offering a comprehensive series of workshops and seminars on grant writing, budgeting, responsible conduct of research (ethics and integrity). In addition, Dr. Louise Robert of CIHR will be visiting Brock University to advise faculty members in the Humanities and Social Sciences on the preparation of competitive applications to CIHR. For more information, contact Frances Chandler at 4183 or [fchandle@brocku.ca](mailto:fchandle@brocku.ca).

Welcome to all new and returning faculty members. We look forward to working with you to support your scholarly pursuits.



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## Capturing the Mood of the Nation Through Popular Music

“Have you heard?” was uttered by most people on September 11, 2001. Nick Baxter-Moore, Associate Professor of Communications, Popular Culture and Film, was at Brock when he learned the news. “I was on my way to teach politics and popular music,” he says. Now he is conducting research on ways in which September 11 and America’s response to these events are reflected in popular music.

Baxter-Moore has long hypothesized that popular music

articulates the values, ideologies and even the emotions of a nation’s populace in a way that other media do not. His current project, *Capturing the Mood(s) of the Nation: Country Music, 9/11 and WWII* supports this notion. It investigates the changing mood of American public opinion, from September 11 to the recent invasion of Iraq, also called GWII — the second Gulf War, as expressed through the medium of country music. “I’m examining a number of influential country songs and the consumption and reception of those songs as a reflection of the climate of public opinion, and in some cases a reflection of the dominant ideology,” he says.

He explains that country music was the most appropriate genre to examine for this project because the views it expresses often correspond to the dominant values of American culture, society, and ideology: “Country music is often referred to as America’s ‘National Popular Music’. It has a history of expressing patriotic sentiments. And it is still largely a singles-based

industry, which allows the music to respond more rapidly to current events than other genres. As a result, it has provided an outlet for many of the political concerns that have evolved in the United States.”

Certain songs were pivotal for his analysis of the shifts in American public opinion in the aftermath of September 11.

“Alan Jackson’s song, ‘Where were you when the world stopped turning?’ captured the initial bewilderment and confusion of the American public, while Toby Keith’s *Courtesy of the Red, White and Blue*, subtitled *The Angry American*

“A number of artists have attempted to redefine patriotism or national identity from the perspective of the working class.”

**Dr. Nick Baxter-Moore**



expressed the anger of the public that followed,” he says.

Baxter-Moore’s current project stems from a larger work called *Proletarians and Patriots: Class & Nation in Popular Music*. In it, he explores the tension between expression of class, focusing on working class politics, and representations of nationalism or patriotism and national identity. “A number of artists have attempted to redefine patriotism or national identity from the perspective of the working class, which is unusual because nationalism is usually expressed in middle class or elite terms. Their music advocates working class politics, and very often explicitly supports socialism, or is critical of capitalism. At the same time, they have tried to explore national identity or patriotism that is different from that which is defined by the elite,” he explains.

The starting point for Baxter-Moore’s research is one of the fathers of modern

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American folk music, Woody Guthrie, and the musicians he inspired, both intellectually and musically, including Phil Ochs, Bruce Springsteen, Steve Earle, and Billy Bragg. “These artists represent diverse takes on the relationship between class and nation, stemming from their different upbringings, nationalities, time periods, approaches to politics, and mixes of class and nation. For example, Billy Bragg is an explicit socialist who has toured the world from Eastern Europe to Latin America singing songs about the conditions of the international working class. But recently, he has taken on the task of redefining what it means to be ‘English’ in modern multicultural Britain.”

Baxter-Moore is also a member of Popular Culture Niagara,

a multi-disciplinary collaborative project that is researching the history and evolution of popular culture in Niagara. He is working with Marian Bredin, Terrance Cox, Barry Grant, Joan Nicks, Russell Johnston, Jeannette Sloniowski, all of Communications, Popular Culture and Film, and Michael Ripmeester of Geography. Funded by SSHRCC (Social Sciences and Humanities Research Council of Canada), the group is examining three major aspects of popular culture: popular music, film exhibition and theatres, and heritage and popular memory. Baxter-Moore is a member of the popular music group, studying the emergence of local musical ‘Sounds and Scenes’ in Niagara.

~ Kimberley Lee

## The Shape of Things to Come

**A**ntibodies are an important part of our immune system. They recognize a foreign invader or a pathogen called an ‘antigen’ and bind to it, signaling the immune system to eradicate it. For the past four years, Associate Professor Dr. Heather Gordon of Brock’s Department of Chemistry has worked to improve the design of pharmaceuticals, giving our immune systems extra artillery in the fight against antigens.

Gordon’s research involves describing the three dimensional shape of proteins, specifically the contours of antibody binding sites, in order to create novel antibodies that bind tighter and better to certain antigens.

“Drugs work by binding to a particular location of the protein,” Gordon says. “They may prevent another natural product in the body from accessing the protein. If a drug has the right shape, it may more efficiently fit into the binding site of the protein.”

Comprised of six peptide loops affixed to the protein surface, the antibody binding site offers a wealth of questions that Gordon seeks to answer. The nature of the flexibility of the binding site and how it impacts on its ability to capture antigens are some of the factors that Gordon is investigating.

The relative flexibility of protein loops can be exemplified by three different circular shapes. Circles that are pulled into long and linear shapes are the least flexible, whereas a flat, round pancake loop is moderately flexible, and a globular, or crumpled, loop is the most flexible. “There are also internal and external frames of reference that I examine. For example, does the internal shape of a loop have several degrees of motion? Externally, does it keep its shape but change its frame of reference or

range of motion?” says Gordon. Other concepts that she investigates are dynamics or how quickly the loops change.

“Intuitively, people understand what flexibility means. However, it is quite difficult to represent comprehensively flexibility in a numerical fashion. Generating millions of conformations allows me to scrutinize various qualities, giving me a way to describe the relative motion, and shape of the loops mathematically.”



Dr. Heather Gordon and former Mentoring Program student Jon Prindiville examine one of millions of conformations

Gordon writes computer programs, which allow her to generate millions of different positions of the atoms making up the binding site of the antibody. Using graphs that plot loop shapes in terms of their degree of linearity and flatness helps to illustrate the data, and enables Gordon to look at all of the different shapes.

In addition to the shape characteristics of individual isolated loops, Gordon has made discoveries about how the flexibility of those loops is affected by the presence of other loops when assembled together in close proximity. In a study conducted as part of Brock’s Mentorship Program, in which top high school students work alongside Mathematics and Science faculty to gain both research experience and credits,

Gordon and a student investigated whether loops would seek totally different shapes when put together, or if they would assume a limited number of the same shapes that they explore when they are isolated.

Gordon likens the loops’ impact on each other to people sharing a dance floor. “We all have our own style of dancing, which does not change from an empty floor to a crowded floor, only when the floor is crowded, we have to forgo some of our dance moves.” When loops are crowded together, they explore a subset of the conformations that they assume when they are isolated from each other.

“This finding is significant because before the drug is even manufactured, scientists could computationally determine the best fit for the antigen,” explains Gordon. “For example, we can mutate one of the amino acid residues so that it biases the antibody to form that shape. This will hopefully make pharmaceutical drugs more effective.”

Gordon’s passion for her research is matched by her enthusiasm for teaching. At Brock’s 2003 spring convocation, Gordon received a Faculty Award of Excellence for Teaching. According to Gordon, “Research at Brock supplements the learning environment that is supplied by class instruction. I enjoy working with undergraduate and graduate students, as well as the high school students in our Mentorship Program.”

Gordon’s work is funded in part by work is funded in part by the Natural Sciences and Engineering Research Council of Canada, (NSERC), which invests in people, discovery and innovation, and funds more than 8,700 researchers annually.

~ Kimberley Lee