



## News Release

FOR IMMEDIATE RELEASE

### **UNM Takes a Lead in Finding New Uses for Established Drugs**

*New paper by UNM researchers highlights experience, expertise in drug repurposing*

**Albuquerque, NM – January 20, 2012** – The University of New Mexico is at the forefront of two powerful trends in drug development, say experts here. The first is an increasing emphasis on drug repurposing – finding new uses for established drugs. (Think aspirin to lower heart attack risk, or the success of Viagra, originally developed to address high blood pressure and angina, a heart condition.) This approach has the potential to trim development costs and shorten the time it takes to bring new therapies to patients who need them. The second trend is the newly prominent role universities are playing in drug discovery, a role that’s being shaped by shifts in the pharmaceutical industry and new incentives from the National Institutes of Health.

A paper by 29 co-authors from UNM and affiliated institutions, published last month in the scientific journal *Drug Discovery Today: Therapeutic Strategies (DDSTR)*, offers one of the clearest perspectives yet on the opportunities and challenges of drug repurposing in an academic environment. The paper draws on UNM’s impressive seven-year effort across three nationally recognized research centers (the UNM Cancer Center, the UNM Center for Molecular Discovery and the UNM Clinical and Translational Science Center) investigating new uses for a dozen different drugs.

“Academic drug discovery has been on the rise for the past 10 years – with drug repurposing as a major area of emphasis – and UNM has taken an early lead in the field,” says Tudor Oprea, MD, PhD, the paper’s lead author. Dr. Oprea, a UNM Cancer Center researcher, is Chief of the Division of Biocomputing and Professor of Biochemistry and Molecular Biology at the UNM School of Medicine.

Co-author Cheryl Willman, MD, Director and CEO of the UNM Cancer Center, agrees. “We believe this paper shows that UNM has been working on drug repurposing more seriously than most academic centers across the country,” she says. “We are committed to this work for the sake of current and future patients, who will benefit from new and more effective therapies.”

## *Drug repurposing, cont.*

“Once the province of pharmaceutical companies, drug discovery is fast becoming a highly competitive field for the nation’s top research universities,” explains co-author Richard Larson, MD, PhD, Vice Chancellor for Research at the UNM Health Sciences Center and Director of the UNM Clinical and Translational Science Center. “Given the depth and breadth of the UNM Health Sciences Center’s commitment to-date, we are well positioned to lead and succeed in meeting critical health needs.”

Larry Sklar, PhD, Director of the UNM Center for Molecular Discovery, one of just nine NIH Roadmap-funded centers in the nation, and Associate Director for Basic Research at the UNM Cancer Center, notes, “Our center has developed proprietary technologies that are accelerating the pace and sophistication of drug discovery at UNM and at collaborating institutions around the world.”

### **Eleven drugs investigated for new uses**

The *DDSTR* paper highlights 11 different drugs or compounds investigated for new therapeutic uses at UNM. One such drug is raltegravir. The story of how this drug, originally developed by Merck to treat HIV infection, has emerged as a possible cancer therapy, sheds light on the creative, intensely collaborative nature of drug repurposing research.

Several years ago, a team of basic and clinical scientists from the UNM Cancer Center, led by Robert Hromas, MD, PhD, discovered that cancer cells overexpress metnase, a protein that helps cells repair their DNA. This overexpression makes cancer cells resistant to treatment because it has the effect of increasing their ability to repair the DNA damage inflicted by cancer drugs. Blocking metnase, the team reasoned, could help improve the effectiveness of existing treatments. Thus began the hunt for metnase-inhibiting drugs.

The team used virtual (computer-based) screening methods to identify promising drug compounds, including the HIV drug raltegravir – which works by inhibiting HIV integrase, a protein structurally similar to metnase. Sure enough, laboratory studies showed that raltegravir, at certain concentrations, blocked the activity of metnase. The drug is now being tested at the UNM Cancer Center in combination with chemotherapy drug cisplatin against head and neck cancers. Led by Julie Bauman, MD, MPH, these pilot clinical trials will determine whether raltegravir can help improve the effectiveness of chemotherapy and lower relapse risk.

Other examples of drug repurposing projects at UNM include pilot testing of ketorolac, an anti-inflammatory drug used for pain relief, as a possible follow-up therapy to surgery for ovarian cancer, and investigations of a class of anti-psychotic drugs called phenothiazines that may prove helpful in treating certain blood cancers.

### **Opportunities and challenges for UNM and other academic institutions**

Successful efforts toward drug repurposing often hinge on the close collaboration of basic scientists and clinicians across multiple disciplines. And this, say the paper's authors, is one of the great advantages to seeking new uses for existing drugs in an academic setting. Institutions like UNM have a strong translational focus – a commitment to translating laboratory research findings into better treatments for patients – and a concentration of both basic scientists and clinicians with multi-faceted expertise in specific disease areas and a keen understanding of key biological mechanisms that could be useful drug targets.

Drawing on UNM's multi-year, multi-project experience, the *DDSTR* paper also highlights challenges that drug repurposing research faces. Dosing and safety issues are a particular concern; UNM's experience to-date suggests that repurposed drugs often show promise against new diseases at substantially different dosages than their originally approved therapeutic indication. When this is the case, the line between drug repurposing and *de novo* drug discovery blurs – the repurposed drug must be subjected to the same safety and dosing trials as a brand-new compound, adding significant time and cost to the development process. Other challenges include the need to integrate pharmaceutical scientists and toxicologists into academic drug development teams, and a highly complex intellectual property landscape that demands specialized legal expertise that many universities are just beginning to develop.

Finally, the paper proposes some large-scale innovations that would benefit drug repurposing research, particularly in academic settings. Among these ideas are the creation of a network of legal, economic and regulatory experts to provide noncompetitive advice to drug developers, and the establishment of a “global healthcare database” that would serve as a single source of knowledge for all pharmaceutically relevant aspects of drugs marketed, withdrawn or submitted for approval around the world.

Drug repurposing is a major trend in drug development – a potentially faster and less expensive route to meeting urgent medical needs. “There is a lot of truth in the saying that ‘we do not need to find new drugs; rather we need to find the patients who can benefit from existing drugs,’” writes world-renowned medicinal chemist Christopher Lipinski in his introductory article in *DDSTR*. The future is full of promise – and UNM scientists are helping to point the way.

### **About the UNM Cancer Center**

The UNM Cancer Center is the Official Cancer Center of New Mexico and the only National Cancer Institute (NCI)-designated cancer center in the state. One of just 66 NCI-designated cancer centers nationwide, the UNM Cancer Center is recognized for its scientific excellence, contributions to cancer research and delivery of medical advances to patients and their families. It is home to 85 board-certified oncology physicians representing every cancer specialty and 126 research scientists hailing from prestigious institutions such as MD Anderson, Johns Hopkins and the Mayo Clinic. The UNM Cancer Center treats more than 60 percent of the adults and

*Drug repurposing, cont.*

virtually all of the children in New Mexico affected by cancer, from every county in the state. Last year, it provided care to almost 16,000 cancer patients. The Center's research programs are supported by \$70 million annually in federal and private funding.

**UNM Cancer Center contact information**

Dorothy Hornbeck, JKPR, (505) 797-6673, [dhornbeck@jameskorenchen.com](mailto:dhornbeck@jameskorenchen.com)

Audrey Manring, UNM Cancer Center, (505) 925-0486, [amanring@salud.unm.edu](mailto:amanring@salud.unm.edu)

###