

# IPM@10

A decade of progress advancing HIV PREVENTION FOR WOMEN

2011 ANNUAL REPORT AND 10-YEAR REVIEW



Dr. Zeda F. Rosenberg



Dr. Peter B. Corr

### Dear friends and colleagues:

Ten years ago, IPM entered the microbicide field with a promise and a clear vision to create products that women in developing countries could use to protect themselves against HIV. Every step we have taken since has brought that vision into sharper focus. Today, we are as optimistic about our mission as we have ever been.

Building on recent successes in the HIV prevention field using antiretroviral drugs (ARVs) for prevention, IPM has launched into late-stage efficacy trials a monthly vaginal ring designed to slowly release the ARV dapivirine — bringing the product from concept to Phase III clinical trials in just seven years.

The AIDS epidemic continues to disproportionately affect women in developing countries, yet they lack practical tools they can use on their own, without the involvement of a male partner. IPM's ring could help empower women with a discreet and long-acting HIV prevention option that would allow them to take control of their own health.

This 10th anniversary edition of our annual report reflects back on IPM's history and looks ahead to the future. As we lead the clinical studies needed for regulatory approval for the dapivirine ring with the Microbicide Trials Network, we are also engaging in access planning, expanding our portfolio with multipurpose technologies and pursuing a pipeline of promising microbicide candidates, including combination ARV products.

This is not something IPM can achieve on its own. We extend our deepest thanks to our partners around the world who amplify our efforts to improve women's health, to our Board of Directors and scientific advisors for their leadership, to the women who step forward to volunteer for HIV prevention studies, and to our donors, whose foresight and generosity have helped support IPM's progress.

Our work together has brought us from a promising concept to a potential new HIV prevention tool that could help make a difference in the lives of millions. And together, we must renew our commitment to advancing health solutions for the world's women.

Seila F. Rosenberg Dr. Zeda F. Rosenberg

Dr. Peter B. Corr

### A Decade of Progress

Since IPM was founded as a product development partnership (PDP) in 2002, we have leveraged public, philanthropic and private sector resources to spur development of safe and effective life-saving technologies women can use to protect themselves against HIV. IPM builds on partnerships at every level — with governments, foundations, researchers, pharmaceutical companies, policymakers, advocates and communities — to bring scientific ingenuity, political will and financial resources to bear on all phases of microbicide development. This annual report highlights our 2011 accomplishments, and reviews IPM's decade of progress in HIV prevention as well as our plans for the future.

### **Planning for Access From the Start**

In 2003, IPM began devising strategies for making a potential microbicide available and accessible to women who need it most. Since then, IPM has laid the groundwork for access through licensing agreements, product acceptability and market research studies, direct discussions with regulatory agencies and country governments around the world, forums hosted with the World Health Organization, relationships with advocates, and product manufacturing strategies to keep costs of future products affordable.

## Plotting Scientific Direction and Pipeline Expansion

IPM and its Scientific Advisory Board (SAB) met for the first time in 2003 to evaluate the current state of the microbicide field and plot the scientific direction IPM would pursue to advance a diverse pipeline of the most promising and viable candidates. This early evaluation led to IPM's focus on highly potent antiretrovirals (ARVs) with multiple mechanisms of action, including reverse transcriptase and entry inhibitors. From the start, IPM has focused exclusively on ARV compounds given their success in treatment and ability to target HIV. The SAB continues to review IPM's progress in microbicide product development, and to provide ongoing scientific advice to staff and the Board of Directors.



### IPM-licensed compounds

Compound	License	Mechanism of action
Dapivirine	Janssen R&D Ireland/ Johnson & Johnson	NNRTI: stops virus from copying its genetic material inside healthy cells
L167, L872, L882	Merck	CCR5 blocker: stops virus from entering healthy cells
BMS 793	Bristol-Myers Squibb	gp120 binder: stops virus from entering healthy cells
Tenofovir	Gilead	NRTI: stops virus from copying its genetic material inside healthy cells
Maraviroc	ViiV Healthcare	CCR5 blocker: stops virus from entering healthy cells
L'644 peptide	Merck	gp41 binder: stops virus from entering healthy cells

### **IPM Negotiates First Royalty-Free ARV License**

In 2004, IPM obtained its first non-exclusive, royalty-free ARV license through a landmark public-private collaboration with Janssen R&D Ireland, one of the Janssen pharmaceutical companies of Johnson & Johnson. This agreement allowed IPM to develop the ARV dapivirine as a microbicide — our first step toward developing what is now IPM's lead product, the monthly dapivirine ring, and toward fulfilling our mandate to expand the microbicide pipeline. Since 2004, IPM has negotiated five other royalty-free licenses from major pharmaceutical companies that allow us to develop and manufacture a total of eight different ARV compounds as microbicides for use in developing countries. These licenses are essential to ensuring that IPM products will be affordable and accessible to the populations who urgently need them.

### **Building Research Capacity in Africa**

With the license for dapivirine in hand, IPM began building on Janssen's earlier work to develop this potent ARV into daily gels and long-acting vaginal rings. To prepare for future clinical trials of these new products, we began in 2004 to build research capacity in Africa. IPM worked with the AMC-CPCD Foundation and other local groups to help establish Projet Ubuzima, a new research center in Kigali, Rwanda, that has participated in several IPM studies and will take part in our Phase III efficacy trial for the dapivirine ring, pending in-country approvals. IPM has since helped launch nine more sites in Africa, investing in infrastructure and staff training, and engaging governments, communities and individuals in our studies.

### Feasibility Results Are In — the Microbicide **Ring Moves Forward**

The year 2005 marked the completion of IPM's first study of the early dapivirine ring prototype to assess feasibility and safety, which was conducted in partnership with Janssen R&D Ireland and the Population Council. Results showed that the ring released dapivirine efficiently, and was safe and welltolerated among healthy, HIV-negative women. The product was the first to adapt a medical technology commonly used to deliver hormones to women — the vaginal ring — to the fight against HIV. This study set the stage for improvements in the ring's design and its application to other drugs in IPM's pipeline. Future collaborations on the ring's development included Queen's University Belfast and Warner Chilcott. To date, IPM has led a total of 14 clinical trials of dapivirine in both gels and rings across Africa, Europe and the United States, from Phase I studies to expanded Phase I/II safety studies in Africa as well as our current Phase III efficacy study of dapivirine ring, known as The Ring Study.

"Ireland has been supporting IPM since the beginning of its journey in 2002. Ireland is a strong supporter of IPM's work to help end the AIDS epidemic by empowering women, who are disproportionately affected, to protect themselves from HIV infection. It is a vital mission and one that will improve the lives of millions."

**Barbara Cullinane, Head of Thematic Sectors and Special Programmes** Section, Irish Aid

### **IPM Launches Manufacturing Facility**

IPM built a facility in the United States to expedite the development and production of optimal vaginal microbicide formulations for clinical safety trials. The first products designed and produced were multiple prototype dapivirine gels for safety studies in 2005, which showed the gels to be safe and well-tolerated. The facility addressed a bottleneck in the speed and availability of manufacturing capacity, and helped lower costs by shortening the time line to clinical trials.

### **Developing Products That Meet Women's Needs**

The promise of microbicides will be realized only if women use them, so it is crucial that the needs and preferences of women and their male partners inform product development from its earliest stages. In 2006, IPM began its first acceptability study of a microbicide gel in Africa to help identify the type of gel women may prefer to use. In total, IPM has conducted three product acceptability studies of different placebo microbicide formulations (vaginal tablets, films, capsules, gels and rings) among more than 1,200 women in five countries in Africa. These studies have shown that vaginal products are acceptable to women, with preferences varying by country — a finding that suggests developing a variety of product options is vital, as has also been observed in the contraceptive field. In particular, IPM's ring has shown very high acceptability among women and their male partners.

### **Prioritizing Products:** Why Dapivirine Ring?

IPM engages in a rigorous prioritization process to identify products that show the most promise in achieving IPM's mission to develop safe and effective HIV prevention tools women will use. IPM prioritized dapivirine for development from among other drugs of the same class on the basis of multiple factors, including supportive preclinical and clinical data, and access considerations. The ring as a delivery device complements the attributes of dapivirine due to its stability, acceptability, ease-of-use, long-acting duration, and potential to deliver more than one ARV as well as an ARV along with a contraceptive hormone. Given its ability to be used for a month or potentially longer, the ring could help ensure consistent use and, therefore, effectiveness.

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### **Scaling Up for Larger Studies**

Focused capacity-building efforts at five of IPM's research center partners in 2007 helped lay the complex groundwork for expanded safety studies of the dapivirine ring and gel in Africa in 2009-10, and the Phase III program now underway. In collaboration with developing country partners, these efforts included renovating clinic space, updating medical and telecommunications equipment, hiring and training staff, and developing community engagement strategies. In addition to helping establish 10 research centers in Africa, IPM has collaborated with more than 20 centers in all, benefitting from their expertise conducting clinical trials in developing country settings and partnering to advance the science of HIV prevention.

Long-term benefits of capacity-building: IPM's studies are also benefitting the areas hardest hit by the HIV epidemic — by strengthening community understanding of HIV, expanding HIV testing and counseling, improving research capacity and access to health services, providing hundreds of employment and professional development opportunities, and supporting the development of frameworks such as community advisory boards. These research centers continue to serve their communities after trials end by conducting studies with other trial sponsors, expanding their research portfolios and supporting community health needs.



The MatCH research center in Edendale, South Africa, was established in 2007 with support from IPM. We also completed renovations that year to three other research centers in South Africa: Madibeng Centre for Research, the Prevention of HIV/AIDS Project, and the Qhakaza Mbokodo research center. All four centers have conducted IPM research studies and are now participating in our Phase III Ring Study.





"Initiatives such as IPM's new Ring Study, which allows women to actively participate in prevention of HIV infection, *must* be supported and emulated to ensure a measurable decrease in the spread of HIV/AIDS in our communities and regions."

- Graça Machel, global advocate for women's and children's rights

## IPM Expands Manufacturing Facility to Speed Ring Development

To design a stable and affordable vaginal ring that could provide sustained release of dapivirine, IPM expanded its manufacturing facility in 2008 to develop microbicide rings. IPM manufactured both dapivirine rings and placebo rings to supply Phase I/II safety trials over the next two years as we worked in parallel to establish a scalable manufacturing process — overcoming a significant technical hurdle to speed the ring's development. Starting in 2010, IPM transferred this process to QPharma in Malmö, Sweden, where rings are produced at a larger scale to supply IPM's Phase III clinical program. Through our in-house ring development and manufacturing efforts, IPM gained valuable technical expertise that continues to play a critical role in the program today as we work toward product licensure.







In 2008, IPM contributed to advocacy efforts at the G8 International Parliamentarians' Conference that led to a call for all G8 countries to increase investment in new disease prevention technology development such as microbicides. The G8 statement is one of more than 10 multilateral global development commitments and policies that include support for microbicide research as a result of efforts by IPM and our partners. Since our inception, IPM has helped develop a network of civil society partners across Europe, sub-Saharan Africa and North America to galvanize political will, public support and financial commitment for microbicide R&D and future product access.

### **Sharing Scientific Progress**

IPM has added to the body of scientific contributions in microbicide research through publishing peer-reviewed journal articles and presenting data at major international conferences, including the Conference on Retroviruses and Opportunistic Infections, the International AIDS Conference and the South African AIDS Conference. For example, in 2010 alone, IPM led or supported work that

was featured in more than 20 oral presentations and 17 posters at the International Microbicides 2010 Conference.

IPM presenting at an International AIDS Conference.





## Ushering in Progress With Expanded Safety Studies

Between 2009 and 2010, IPM began expanded Phase I/II safety trials of dapivirine gel and ring, based on supportive data from earlier safety studies. During this time, we implemented a total of six studies evaluating the safety, acceptability and pharmacokinetic profile of the products. These studies took place in five African countries, Belgium and the United States. The gel studies piloted an innovative design called "daily monitored adherence" or DMA, during which study participants had daily contact with researchers either by home visits or local drop-off centers where they returned the daily-use gel applicators. Results from these studies showed dapivirine, in both gel and ring form, was safe and well-tolerated in healthy, HIV-negative women, and supported the dapivirine ring's advancement to Phase III efficacy studies.

### **HIV Incidence Studies Point The Way to Phase III**

Determining incidence — or the rate of new infections — in communities most profoundly affected by HIV helps to supply researchers and national governments with needed data on the size and scope of the epidemic in local communities so they can effectively target prevention efforts. These studies also help determine possible locations for future HIV prevention trials to ensure the trials demonstrate meaningful results as quickly as possible. For example, a 2010 IPM study at five sites in South Africa confirmed annual HIV incidence rates ranging between 4 percent and as high as 11 percent.

IPM research center partners in the KwaZulu-Natal province of South Africa are participating in IPM's Phase III study of the dapivirine ring. In all, IPM has conducted a total of 13 incidence studies since 2004, involving thousands of women across sub-Saharan Africa.

## Milestones in the HIV prevention field

Landmark studies in the field since 2005 have shown the great progress made in HIV prevention, especially with ARV-based strategies.

2005-6: Male circumcision found to reduce risk of HIV

infection in men by more than half

2009: RV-144 study shows for the first time that the risk

of HIV infection can be reduced by a vaccine

2010: First proof-of-concept established for ARV-

based prevention: tenofovir microbicide gel for women, and Truvada as pre-exposure prophy-

laxis (PrEP) for men who have sex with men

2011: Daily PrEP is found to reduce HIV infection

 $among\ discordant\ heterosexual\ couples\ and$ 

adults by up to 73%

Early initiation of ARV therapy by HIV+ individu-

als protects uninfected partners by 96%

### **Joined Against a Global Foe**

IPM and the US National Institutes of Health-funded Microbicide Trials Network (MTN) joined forces in 2011 to implement Phase III trials of the dapivirine ring. This partnership follows a formal agreement forged in 2005 by IPM and the National Institute of Allergy and Infectious Diseases (NIAID), part of NIH, to accelerate microbicide development, opening the door to scientific cooperation and information-sharing. IPM and MTN also jointly brought the first combination ARV microbicide, the dapivirine-maraviroc ring, into Phase I clinical safety trials in 2011. This is the first study to evaluate the ARV maraviroc (an entry inhibitor) as a

microbicide (see chart p. 1). In addition, IPM and MTN collaborated on a male tolerance study of dapivirine gel.



### From Promise to Phase III in 7 years

The year 2011 saw the culmination of IPM's clinical and community engagement efforts as we prepared to launch our lead product, the dapivirine ring, into Phase III clinical trials. In the seven years since we negotiated a royalty-free license with Janssen, IPM conducted preclinical work on dapivirine, developed and optimized several ring designs, manufactured the product for Phase I and Phase I/II clinical trials,



conducted six clinical safety trials of the dapivirine ring alongside 25 other research studies through 2011, and launched the Phase III efficacy program for the ring, now underway. As a platform technology, the ring is also being used to design a multipurpose prevention product that combines an ARV with a contraceptive as well as a combination product that could deliver multiple ARVs.



### IPM Launches its Licensure Program With First Efficacy Trial of a Microbicide Ring

In 2012, IPM launched The Ring Study — the first efficacy and long-term safety study of a microbicide ring for HIV prevention, with results expected in 2015. The study will be conducted among 1,650 women in South Africa, and pending in-country approvals, Rwanda. IPM's ring slowly releases the ARV dapivirine over the course of a month to provide discreet and easy-to-use protection against HIV. Regular use of prevention tools is essential to their effectiveness, and because IPM's ring would be used monthly, it may help encourage women to use it consistently. The Ring Study is part of a broader licensure program being conducted in partnership with the MTN, which also includes MTN's larger Phase III ASPIRE study, to launch in 2012. Together, these sister studies, along with other smaller supporting safety studies, are designed to provide the strength of evidence needed for product licensure for the dapivirine ring.

## What does the future hold?

### **Access: Getting Ready Together**

If results from the studies in IPM's dapivirine ring licensure program show the ring to be effective and safe for long-term use, we will seek regulatory approval for product licensure, and collaborate with key partners to help ensure it is made available at low cost to women in developing countries as soon as possible. IPM and its network will continue to refine our access strategy throughout the ring licensure program to expedite the product's roll-out, availability and affordability, including potential distribution and financing mechanisms. We are also working to optimize manufacturing processes and scale-up to minimize the cost of production. In addition, IPM is evaluating whether the ring could be used for 60 days or longer to provide additional cost savings in the future.

### **Multipurpose Prevention Technologies: Advancing Solutions That Meet Multiple Health Needs**

High rates of HIV and unintended pregnancy are significant causes of health complications and death for young women worldwide - demonstrating a clear need for discreet, long-acting tools women can use to address these issues in tandem. Through a grant from USAID, IPM is developing a 60-day dual-purpose ring, currently in preclinical stages, that combines the ARV dapivirine with a contraceptive to address women's urgent HIV prevention and reproductive health needs in a single product. The dual-purpose dapivirinecontraceptive ring could empower women with a convenient and easy-to-use way to protect their health.

"Bravo to team IPM for their decade of commitment developing tools to empower women with HIV prevention. IPM's pioneering work on microbicides has been impressive to watch, and we were thrilled to see its expansion into family planning with research on a multipurpose ring to prevent HIV and pregnancy. Women Deliver is excited to see what the next decade brings with IPM's efforts to protect the health of women and girls around the world."

- Jill Sheffield, President, Women Deliver



As IPM oversees the dapivirine ring licensure program, prepares for access, and expands its portfolio with multipurpose prevention technologies, we are also developing a pipeline of other candidates in a variety of novel formulations to expand women's options and move the science of HIV prevention forward. IPM is working on multiple active ARV drugs with different mechanisms of action, including a gp120 binder and entry inhibitors such as maraviroc. IPM is formulating these compounds as gels, rings, films and tablets, both as singleagents and combination products. Combination ARV

products would target HIV at different points in its life cycle and may provide greater protection against HIV than a single drug alone.



### IPM Donors since 2002

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Canadian International Development Agency

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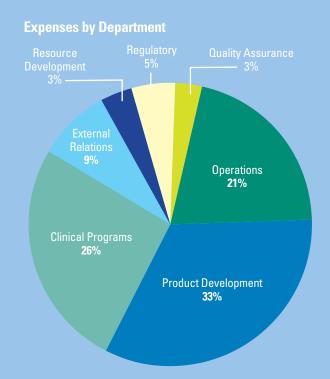
IPM's cash available balance entering 2012 was \$43 million. In a climate of continued global recession and the resulting financial impact, IPM streamlined costs by refining our work model and cost structure, and by prudently managing the product pipeline. IPM contained costs, made staffing adjustments and enhanced existing financial and operational systems to support management decision-making and program implementation.

Consistent with our ongoing efforts to match expenses with budget realities, 2011 was a year of fiscal and operational preparation for implementation of the dapivirine ring licensure program in 2012. Conducting clinical trials in developing countries requires substantial investments to improve infrastructure and train research center staff to support thousands

of trial participants over several years. Investment is also required to maintain the program and operations support needed for product evaluation. To comply with the requirements of in-country institutional review boards, IPM worked to ensure all necessary funds for the Phase III dapivirine ring trial were in place in 2011.

As IPM oversees the dapivirine ring licensure program, we will also reemphasize pipeline and continue preparing for access, given the potential for the dapivirine ring to be proven safe and effective. With new partnerships, an experienced management team and a committed Board of Directors, IPM is well-positioned to advance its mission of developing HIV prevention tools for women in developing countries.

Assets	Dec. 31, 2011
Cash and cash equivalents	\$11,717,269
Investments	\$34,124,359
Accounts receivables	\$1,998,497
Prepaid expenses and other assets	\$1,188,891
Property and equipment, net	\$4,603,968
Total Assets	\$53,632,984
Liabilities and Net Assets	
Liabilities	
Accounts payable and accrued expenses	\$3,138,877
Grants advances and deferred revenue	\$28,615,297
Total liabilities	\$31,754,174
Net Assets	
Unrestricted	\$21,878,810
Temporarily restricted	\$0
Total net assets	\$21,878,810



To learn more about how to prevent HIV in women worldwide and help save millions of lives, visit www.IPMglobal.org.



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