From Ideal to Real:

The Multipurpose Prevention Technology (MPT) R&D Pipeline

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Our challenge: *how to address the primary sexual and reproductive health (SRH) needs of all women?*

1. Healthy timing & spacing of intended pregnancies
2. Protection against HIV
3. Protection against other STIs

All while taking into account changing needs and risks due to age, relationship status, and economic status.
Complexities of developing multipurpose prevention technologies (MPTs):

**INDICATION**
- Pregnancy
- HIV
- HSV
- HPV
- Gonorrhea
- Syphilis
- Chlamydia
- BV
- Candida
- Trichomonas

**MECHANISM OF ACTION**
- Barrier
- Non-HC
- Anti-Microbial
- Probiotic
- Anti-viral
- Anti-fungal

**DOSAGE & ADMINISTRATION**
- Topical Per-coital
- Oral Per-coital
- Topical Daily
- Oral Daily
- Topical Sustained
- Systemic Sustained

**FORMULATION & DELIVERY**
- Vaginal gel
- Vaginal film
- Vaginal tablet
- Vaginal ring
- Non-IVR device
- Oral pill
- Implant
- Injection

Adapted from J. Romano presentation, *Multipurpose Prevention Technologies for Reproductive Health 2011 Symposium*, Washington, DC
Developing Target Product Profiles (TPPs) for MPTs: Priorities of Providers and Researchers

US and African Providers Survey Outcomes:

✓ Priority Indications:
  • Pregnancy + HIV
  • Pregnancy + HPV
✓ Dosage Forms:
  US preference for oral; African preference across several dosage forms, which may help to foster greater acceptance / use

SRH Researchers Survey Outcomes:

✓ Priority Indications:
  • Pregnancy + HIV
  • HIV + HSV
✓ Dosage Forms:
  Major determining factor is PRODUCT ADHERENCE, so highest development priority is Intravaginal Rings (IVRs)

Outcomes of the MPT TPP process:

Although challenging, it is possible to identify general development priorities and product design targets for MPTs

- Useful to funders in terms of investment priorities
- Useful to developers in terms of R&D focus
Priorities for 1st-generation MPTs:

✓ “On demand” products:
  - Used around the time of intercourse
  - Emphasis on non-hormonal contraception
  - Appropriate for women who have infrequent sex, or who would like more direct control over their own protection

✓ Sustained release devices (IVRs):
  - User-initiated, but do not require daily action
  - Should increase adherence, and therefore overall effectiveness
“On demand” Products: Gels

- **Tenofovir Gel** (CONRAD)
  - First-ever coitally-dependent vaginal microbicide shown to be effective in preventing HIV (39%) and HSV-2 (51%) (CAPRISA 004 proof-of-concept trial)
  - Confirmation trial (FACTS 001) is enrolling 2,600 HIV-neg. women at nine sites in South Africa
  - Results are expected in early 2014

- **MZL Combination Topical Gel** (Pop Council)
  - Combines MIV-150 + Zinc Acetate + the progestin LNG in carrageenan gel
  - Prevents pregnancy, HIV, HSV-2 and HPV (based on in vivo studies)
  - Provides effective protection for up to 24 hours
  - Gel optimization and initial PK in vivo is underway
“On demand” Products: Devices + Active Agents

❖ SILCS + TFV Gel

1. SILCS Contraceptive Barrier (PATH, CONRAD, NICHD)
   - “One size fits most” silicone diaphragm that does not need to be fitted by a clinician
   - 6-mo typical use pregnancy rate comparable to standard fitted diaphragm when used with a contraceptive gel (10.4%)

2. Plus TFV Gel (CONRAD)
   - Use the SILCS barrier as a delivery device for TFV gel, reformulated to enhance contraceptive activity
   - Would provide a non-hormonal method of protection from pregnancy, HIV and HSV-2
   - Designed for effective protection for up to 24 hrs
Sustained-Release Devices: Combination IVRs

❖ 30-day MZL Combination IVR (Population Council)
  ▪ Combines MIV-150 + Zinc Acetate + LNG
  ▪ Demonstrated successful release in single-API rings, so MZL IVR will likely release all three APIs
  ➢ The MZL IVR could prevent pregnancy, HIV and HSV-2

❖ 60-day Dapivirine + HC IVR (IPM)
  ▪ Combines the ARV dapivirine (DPV) with a hormonal contraceptive (HC)
  ▪ DPV+HC ring formulation and testing are underway
  ➢ The DPV+HC IVR could prevent pregnancy and HIV

❖ 90-day Tenofovir + LNG IVR (CONRAD)
  ▪ Combines tenofovir (TFV) with LNG
  ▪ TFV+LNG ring formulation and testing are underway; clinical studies in 2013
  ➢ The TFV+LNG IVR could prevent pregnancy, HIV and HSV-2
These first-generation MPTs could...

- Simultaneously prevent pregnancy, HIV, HSV-2, and HPV.
- Provide a diversity of delivery and dosing options that meet the needs of women and girls as their sexual and reproductive health concerns change over time.

Our Ultimate MPT R&D Goal:

MPTs that are appropriate for provision and use in low resource settings in sub-Saharan Africa and South Asia, and that also address SRH concerns in the U.S., Europe, and other high resource settings.

Thank you!