FOSTERING THE NEXT GENERATION OF RESEARCHER IN HEALTH DISPARITIES!

Translational Research at the Puerto Rico clinical and Translational Consortium.
Series Objective.

1. Define the concepts of health disparities, health equity, cultural competence, and social determinants.
2. Understand different methodologies to address health disparities in the communities.
3. Understand different intervention strategies to address health disparities in the communities.
4. Describe examples of health disparities research across the translational continuum.
Relevance

- Threats to the health status and well-being of underserved and minority populations remain a major challenge.
- Advances in knowledge on mechanisms of disease and translation of this knowledge to the prevention and therapy of disease remains incomplete, restricted and slow, especially for underserved and minority populations.
- The vision of the Puerto Rico Clinical and Translational Research Consortium (PRCTRC) is to serve as a vital and catalytic element in efforts to understand, define, and address health disparities in Hispanic populations.
## Distinctions Among the Concepts

<table>
<thead>
<tr>
<th>Concept</th>
<th>Research question</th>
<th>Application to policy or program planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disparity</td>
<td>Is there a difference in health status rates between population groups?</td>
<td>Is the difference too large?</td>
</tr>
<tr>
<td>Inequity</td>
<td>Is the disparity in rates due to differences in social, economic, environmental or healthcare resources?</td>
<td>Is the distribution of resources <em>fair</em>?</td>
</tr>
<tr>
<td>Inequality*</td>
<td>How do rates vary with the amount of the resource, and how is the population distributed among resource groups?</td>
<td>Can the distribution of the population among resource groups and/or the rates within resource groups be influenced?</td>
</tr>
<tr>
<td>Burden</td>
<td>How many people are affected in specific groups and in the total population?</td>
<td>How many people would benefit from interventions?</td>
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*Questions and applications refer to ordered groups*
Background

- Serious Health Problems in Hispanics
  - Cancer
  - Heart Disease
  - HIV
  - Metabolic Disorders
  - Stroke
  - Diabetes
  - Mental
1. The prevalence of obesity among female Mexican American adults during 2007–2010 was larger than the prevalence among female white, non-Hispanic adults during the same years.
2. In 2010, largest prevalence of diabetes were among Hispanic and non-Hispanic African American adults compared with prevalence among white, non-Hispanic and Asian adults.
3. During 2009-2010, prevalence of periodontitis among Mexican American adults aged 30 years and older was among the largest compared with white, non-Hispanic adults of same the age group.
4. In 2010, Hispanic adults continue to have a substantial rate of HIV infection compared with white adults.
5. **Teenage birth rates** among Hispanic females (Mexicans and Puerto Ricans) in 2010 were larger than rates among white, non-Hispanic females. In 2010, the birth rate for Hispanic females aged 15-19 years was approximately five times the rate for Asian/Pacific Islanders, twice the rate for non-Hispanic whites, and somewhat higher than the rates for non-Hispanic black and American Indian/Alaska Native adolescents.

6. Among Hispanic adults aged 18-64 years a larger percentage was **without health insurance** in 2010 than white, non-Hispanic adults of the same age group.

7. A smaller percentage of Hispanic adults aged 50-75 years reported being up-to-date with **colorectal cancer screening in 2010** than their non-Hispanic adult counterparts.

8. Smaller percentages of Hispanics (including Mexican Americans looked at separately) and non-Hispanic African Americans adults with high blood pressure in 2010 had **control of their blood pressure** compared with white, non-Hispanic adults.
9. Among Hispanics aged 6 months of age or older a smaller percentage were vaccinated against influenza during the 2010-2011 influenza season than white, non-Hispanic persons of the same age group.

10. In 2009, if Hispanic adults had the same hospitalization rate as Asian and Pacific Islander adults they would have had **240,000 fewer hospitalizations** and saved $700 million.

11. In 2011, a larger percentage of Hispanic adults **did not complete high school** and had incomes less than the federal poverty level compared with white, non-Hispanic adults. In addition, in 2010, a larger percentage of Hispanic adults aged 18-64 years were unemployed compared with white, non-Hispanic counterparts.

12. In 2010, a larger percentage of Hispanic workers were **employed in high-risk occupations** than white, non-Hispanic workers.
WHY

- ISSUES of Health Care ACCESS?
- Genetics?
- Compliance?
- Policy?
- Health Care Coverage?
- Training of Physicians?
- Medical Literacy?
- High Risk Practices?
- Fear?
- Others

- Translational research includes two areas of translation. One is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans. The second area of translation concerns research aimed at enhancing the adoption of best practices in the community. Cost-effectiveness of prevention and treatment strategies is also an important part of translational science.
Translational research, “transforms scientific discoveries arising from the laboratory, clinical, or population studies into clinical applications…”

Source: National Cancer Institute, National Institutes of Health
"Translational research transforms scientific discoveries arising from laboratory, clinical, or population studies into clinical applications to reduce cancer incidence, morbidity, and mortality."
Translation:
The process of turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public — from diagnostics and therapeutics to medical procedures and behavioral changes.

Translational Science
The field of investigation focused on understanding the scientific and operational principles underlying each step of the translational process.
<table>
<thead>
<tr>
<th>PRCTRC Translational Stages Definitions</th>
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<tbody>
<tr>
<td><strong>T1: Translation to Human</strong></td>
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<tr>
<td>Definition</td>
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<tr>
<td>With T1 translational research, findings from basic research are tested for clinical effect and/or applicability. T1 research yields knowledge about human physiology and the potential for intervention.</td>
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<tr>
<td>Examples</td>
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<tr>
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<tr>
<td>Preclinical and Animal Studies</td>
</tr>
<tr>
<td>Human Physiology (study must be related with a human disease)</td>
</tr>
<tr>
<td>First in Humans (FIH) (healthy volunteers)</td>
</tr>
<tr>
<td>Proof of Concept (POC)</td>
</tr>
<tr>
<td>Phase 1 Clinical Trials (dose and toxicology)</td>
</tr>
<tr>
<td>First time evaluation of a biomarkers (antibodies, none treatment involved)</td>
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Increasing emphasis is being placed on measuring return on research investment and determining the true impacts of biomedical research for medical practice and population health.
Issues

- Translation is not linear
- Penetration of the most successful interventions rarely exceeds 1% of target population
- Barriers to transfer
  - Political atmosphere
  - Public awareness
  - Financing concerns
  - Timing
More Issues

- Discovery of the solution is out of synch with providers “readiness to use it”
- Scientific inquiry can limit translation
- Costs of training and lag time until performance exceeds baseline

Source: Ginexi & Hilton 2006
Creation of a new intellectual discipline

- **Strengths**
  - Designed to improve health
  - Systems based approach proposed
  - Multi-disciplinary
  - Innovative
  - Flexible and responsive to environment
  - Collaborations within and outside of academic centers
Creation of a new intellectual discipline

- Potential barriers
  - Institutional culture change
  - Infusion of resources
  - Infrastructure for funding, payments, tenure, institutional reviews
  - Existing curricula for training scientists emphasis on independent research
  - Shortage of mentors with skills
## The Translation Continuum

Source: National Cancer Institute

<table>
<thead>
<tr>
<th>Basic Scientific Discovery</th>
<th>Early Translation</th>
<th>Late Translation</th>
<th>Dissemination</th>
<th>Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promising gene</td>
<td>• Partnerships</td>
<td>• Phase III trials</td>
<td>• To community providers</td>
<td>• Adoption of advance by providers, patients, and public</td>
</tr>
<tr>
<td>• Basic epidemiological finding</td>
<td>• Intervention development</td>
<td>• Regulatory approval</td>
<td>• To patients and public</td>
<td>• Payment mechanisms to enable adoption</td>
</tr>
<tr>
<td>• •</td>
<td>• Partnerships</td>
<td>• Health services research to support dissemination and adoption</td>
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</table>
Prolonged HIV-1 infection leads to neurological debilitation, including motor dysfunction and frank dementia. We propose to use the supernatant of neural progenitor cells (NPC) more specifically secreted factors by these cells known as leukemia inhibitor factor (LIF). The NPC are particularly interesting because correspond a complex microenvironment capable to release factors to induce differentiation and give origin to neurons, astrocytes and oligodendrocytes.
<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016 (n=220)</td>
<td>75</td>
<td>65</td>
<td>18</td>
<td>11</td>
<td>51</td>
</tr>
<tr>
<td>2016-2017 (n=229)</td>
<td>85</td>
<td>60</td>
<td>24</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>
T2: Epigenetic Variations of Asthma in Puerto Rican Children

Glorisa Canino, PhD
Professor

Determine whether and how psychosocial stress leads to reduced response to common treatments for asthma control (ICS) and relief of asthma symptoms (short-acting inhaled β2-agonists) in a high-risk group (Puerto Rican children). To achieve this goal, we have assembled an outstanding multidisciplinary research team.
T3: Behavioral Randomized Study to increase Participation of HIV+ individuals in Anal Cancer Clinical Trials

Conduct a randomized controlled trial at the 9 immunological clinics of the Oficina Central de Asuntos de SIDA y Enfermedades Transmisibles to test and assess the effectiveness of an audiovisual clinical trial educational intervention in increasing screening and participation rates in clinical trials. Specifically, clinical trials aimed at developing anal cancer screening methods and guidelines for people living with HIV/AIDS.

Ana Patricia Ortiz Martinez, PhD
Associate Professor
T4: Multi-site trial using short mobile messages (SMS) to improve infant weight in low-income minorities

Pilot test weekly SMS sent to parents/caregivers of infants to improve feeding practices and decrease excessive weight gain in infants who are participants of the WIC program in two distinct locations, Puerto Rico and Hawaii; to assess acceptability and practicality of the intervention; and to assess acceptability of collecting blood spots in future studies. The weekly messages will focus on reinforcing the breastfeeding messages provided by WIC, preventing overfeeding, delaying introduction of solid foods, and delaying and reducing baby juice consumption, which are key issues in low-income populations.

Cristina Palacios, PhD
Associate Professor
“We’re almost free, everyone! I just felt the first drop of rain!”