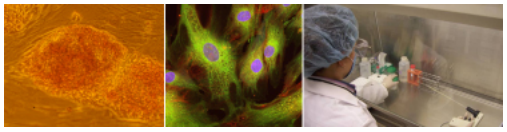
JOHN PAUL II
MEDICAL RESEARCH INSTITUTE



Progress Report on Alzheimer Disease Research Program

June 2014

About Us

JOHN PAUL II
MEDICAL RESEARCH INSTITUTE

- The John Paul II Medical Research Institute (JP2MRI) seeks to find cures and therapies exclusively using a variety of adult stem cells and cancer cells.
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- No embryonic stem cell research.
- Developing research technologies that advance drug discovery and regenerative and personalized medicine for chronic disease, rare diseases and cancer.
- Engaged in educational outreach to increase number of scientists and medical practitioners that will work with adult stem cells.
- Emphasis on medical bioethics that is consistent with the dignity of human life.

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Institute Overview

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- Focus: Reduce the bottlenecks and streamline drug development for therapeutic areas underdeveloped and underperformed by pharmaceutical industry (e.g. neurological and pulmonary disease, rare disease and cancer).
- Technology: Create novel stem cells that can be used as a cell therapy or as a tool for screening drugs that may be efficacious for further drug development.

Unsustainable Pharmaceutical Drug Development Costs and Disincentives For Finding Cures

- 1970 – 140 million — 7 years to approval
- 1980 – 320 million
- 1990 - 800 million
- 2000 – 1.2 billion — 12.5 years to approval
- 20 year patent life of a drug.
- Drug development failure rate for neurological diseases is 90 percent.
- Number of annual FDA approved drugs declined since 1970.
- Increasingly more difficult for pharmaceutical companies to achieve ROI within the patent protection period.
- Conclusion - costs are not sustainable and drug makers are risk averse to cure disease – more profitable to control disease or alleviate symptoms.

Academic Research Rarely Translates into Treatments or Cures

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- Contopoulos-Ioannidis, Am. J Med 2003;114:477-484
- Examined 6 high-impact basic science journals and identified 101 articles published between 1979-1983, which clearly stated that the technology studied had novel therapeutic or preventive promise.
- By Oct 2002, 27 of promising technologies resulted in a randomized trial; 19 led to one positive random trial. Only one led to a licensed treatment. Best prediction for licensed treatment results when academia collaborates with industry.
- Academic basic research rarely translates into licensed clinical treatments or cures.
- **Since private foundations and NIH fund academic research, these funding sources rarely translates into clinical treatments or cures.**

Factors Leading to A Perfect Storm

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- Pharmaceutical industry eliminating thousands of research scientists. Increased research outsourcing to China and India.
- Academia has lost over 50 percent of physician-scientists over the past 20 years with an ivory tower culture that discourages risk taking and product development.
- Government's 17 trillion dollar debt limits future research investment.
- Affordable Care Act will alter healthcare forever – 500 billion removed from Medicare budget over next 10 years.
- Healthcare rationing predicted on a massive scale.
- **Healthcare challenges requires innovation and entrepreneurial spirit.**

Secular Society Pursuit of Embryonic Stem Cell Research and Human Cloning

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- Secular organizations fixated over pluripotent stem cells like embryonic stem cells (ESC) – differentiates into over 200 specialized cells, but form tumors.
- Over 300 private foundations and academic centers support ESC research.
- Human cloning pursued to avoid tissue rejection of ESC during transplantation.
- Cloning finally achieved at the University of Oregon.
- Iowa and other states pass Human Cloning Bill in 2004.
- Dr. Yamanaka receives the Nobel Prize in 2012 for discovering induced pluripotent stem (IPS) cells, created by genetic reprogramming of adult cells - an acceptable ethical alternative.
- Dr. Yamanaka's IPS cell technology had safety concerns – also formed tumors and required viruses which poses an infectious risk.

A New Paradigm to Find Treatments and Cures

- It is time do things fundamentally different.
- What fundamental technical advancement is needed to dramatically improve drug development at lower cost and develop stem cell therapies to regenerate damaged tissue?
- Answer: We need a new paradigm - more innovative, accurate and capital efficient ways to develop therapeutics and regenerative medicine at lower costs.
- To achieve that end – create stem cell lines from patients that can be used to screen drugs or serve as cell therapies to regenerate diseased organs.
- **Hypothesis: If a stem cell has all the diseased attributes, can testing a "disease in a dish" with an experimental drug predict clinical outcome?**

Innovation To Reduce the Cost And Time In Drug Development

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Drug Screening

Major Pharma Restructuring

- Traditional model broken
- Downsizing R&D
- Massive Patent Expirations

Pharma Needs

- Novel drug leads & targets
- Access to innovation; viable IP
- Fill pipeline gaps

Drug Libraries
Biotech
Government
Academia

JP2MRI
Create "Disease in a Dish"
Screen Drugs
Or Regenerative Cell Therapies

Pharma

Stage:	Discovery Science	Lead Discovery	Lead Optimization	Pre-clinical studies (to IND)	Clinical Development	Registration & Launch

Historical High Failure Rate

Major Gap Support From Foundations, Academia, Government

Proof of Concept - Institute Helps Siblings with NPC

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- In December of 2008, the Institute helped Peyton Hadley, 11, and his sister, Kayla, 8, who have Niemann-Pick Type C (NPC), a rare and fatal neurodegenerative disease.
- Genetic defect due to inability to to metabolize cholesterol.
- Most common form of juvenile dementia.
- Brain pathology is similar to Alzheimer's disease.
- We were first to create adult stem cells for rare disease.

- Fat-derived stem cells tested with experimental cyclodextrin that cured cholesterol defect.
- Children received FDA compassionate use which halted disease in older sibling and prevented onset in younger sibling – validates the new paradigm of a "disease in a dish" approach.

Limitations Of Prior Research

- Fat-derived stem cells do not transform well into neurological cells and other specialized organs.
- Cyclodextrin is too big to cross the blood-brain barrier – need smaller molecules.
- Need a pluripotent stem cell because it is better in transforming into neurological cells and other specialized cells.
- Need IPS cell technology to treat Alzheimer's disease.
- Need IPS cell technology that is safer than current art – free of virus and free of neoplastic (tumorous) side effects.
- **Focus of recent Alzheimer's research.**

Research Funding Devoted In 2013

- JP2MRI raised $172,000 in 2013 and 55 percent devoted towards research. Dr. Moy received ~1,000 dollars in compensation and devoted 40 hours a week towards research.
  - Private funds from donors including the Knights of Columbus.
- CET contributed $132,000 toward research project.
- Dr. Moy contributed $60,000 of in-kind support from medical practice.
- Comparison with the Alzheimer's Association from 2012:
  - Raised 119 million.
  - CEO paid 2.7 million in compensation.
  - Officers paid between $183,000 - $672,000.
  - 14 % of budget devoted towards research.
  - Very difficult to evaluate metrics whether funding led to a pipeline of drugs.
  - Wrong scientific and business model to advocate for patient groups.

Outcome of Our Research Effort

- Created an IPS cells that doesn't require a virus.
- IPS cell that when injected into mice did not produce a tumor.
- IPS cell that is superior to an embryonic stem cell.
- IPS cell that is superior to human cloning – cheaper to manufacture and free of tumor.
- IPS cell technology that can create a "disease in a dish" model to screen drugs for patients with different forms of dementia and many other diseases.
- IPS cell technology that can be used as a cell therapy.
- Research reported at the 12th Annual International Society of Stem Cell Research.

Alzheimer's and Dementia Pipeline For Future Therapy

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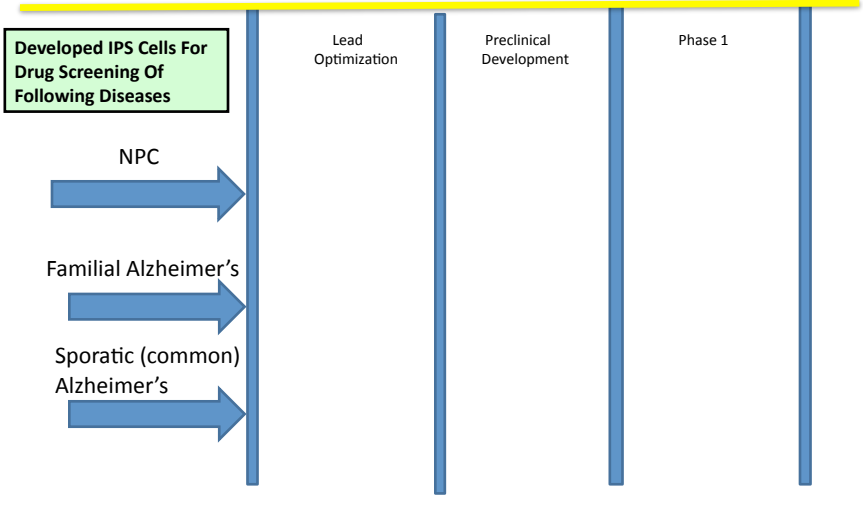

Leveraging Research

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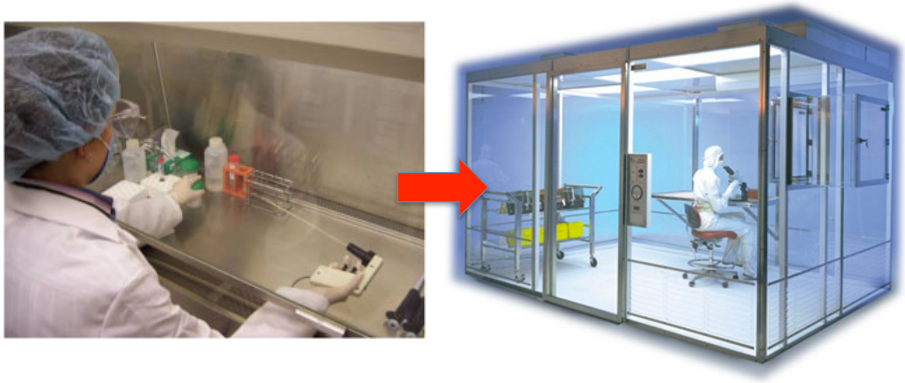
- NIH grants submitted to follow through on further development.
- Pursue national support from the Knights of Columbus.
- Increase support of Catholics and increase national awareness.
- Lobby For Iowa Regenerative Medicine Tax Credit.
- Stem cell therapies require manufacturing under good manufacturing practice (GMP) to receive FDA approval to initiate clinical trials.
- GMP requires a clean room which will cost 500K dollars.
- University of Iowa will commit 125K dollars to the cost.

Progressing to Cell Therapy At BioVenture Center

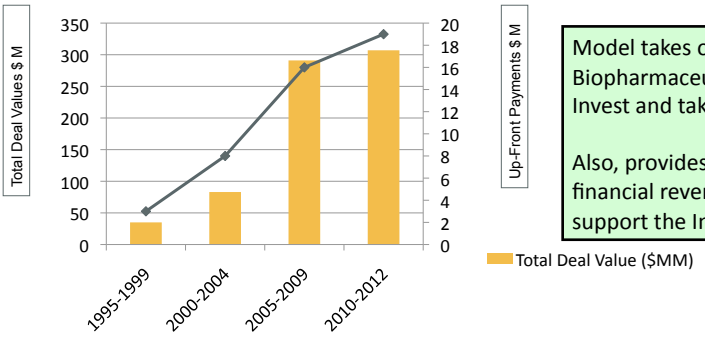
Good Laboratory Practice (GLP) **Good Manufacturing Practice (cGMP)**



Institute Has Chosen a Non-Profit Biotech Model As A Self-Sustaining Business Model To Reduce the Risk for Stakeholders.

Average Preclinical Deal Terms: (1995-2012)**

**Adapted from: "Value Creation & Sharing Among Universities, Biotechnology & Commercialization Partners": RECAP by Deloitte 2009



Model takes out the risk for the Biopharmaceutical industry to Invest and take over.

Also, provides a self-sustaining financial revenue stream to support the Institute's mission.

Future Research Objectives

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- Convert IPS cell lines into neurological cells from patients.
- Expand clinical research operation to recruit patients with genetic based dementia and classical Alzheimer patients to collect clinical data and tissue samples to generate IPS cells.
- License and screen drug libraries from third parties (biotech companies, government laboratories and academic centers).
- Create a more quicker and cheaper way to custom design drugs based on patient-derived IPS cells.
- Develop cell therapies based on IPS cells under GMP conditions and test in animal models to achieve FDA approval for initiating clinical trials.

Summary

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- Non-profit biotech model with pro-life ethics.
- Achieving major technical milestone for Alzheimer's disease and other chronic disease.
- Devotes greater proportion of of budget towards research than established private foundations like Alzheimer's Association.
- Resourceful and prudent use of funds.
- Milestones provide proof of concept to leverage further support.
- Scientific and business model designed to be self-sustaining with clear metrics:
  - # Drugs approved by FDA for clinical trials.
  - # Patients enrolled in clinical trials.
  - # Patients receiving FDA compassionate use from experimental drugs.
  - # Drugs ultimately FDA approved.
  - # Goal is to commit 60-70 percent to drug research and development.

What You Can Do To Help

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- Send donations.
- Organize fundraising events in your local community.
- Organize efforts in your local community to set up a tissue collection research program for patients with dementia.
  - Educate your community on due diligence of private foundations that advocate for Alzheimer patients – i.e. (1) What percent of their budget is devoted towards research?; and (2) What metrics do they use to define success? (decrease drug failure rate, find treatments, ect or simply publishing papers, helping faculty get tenure, ect.).
  - Educate and recruit your local doctors of the program.
  - Help facilitate getting program established through an Institutional Review Board at your local hospital.
  - Organize media attention to your program and connection to the Institute.