Global Exposome

Compassionate Science, Sustainable Planet

Luis Falcón, MD, MSc
About me

Luis Falcón
Founder, GNU Solidario
Author of GNU Health
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Education

- Computer Scientist
- Physician
- Genomics & Medical Genetics

Activism

- Social Medicine
- Animal Rights
- GNU Solidario is a non-for-profit organization
- Works globally
- Focused on Social Medicine
- Fights for the rights of human and nonhuman animals
- NPO behind GNU Health and Global Exposome Project
Projects from GNU Solidario
GNUHealth: The Libre Digital Health Ecosystem
Free beagles from experiments at University of Barcelona, and replace them by ethical, human-relevant methods

A call to accelerate human-focused medical research
The exposome

Exposome/ (ˈɛkspəʊˌsəʊm) /

“The cumulative measure of environmental influences and associated biological responses throughout the lifespan, including exposures from the environment, diet, behavior, and endogenous processes.”

Miller and Jones (2014)
Humanity cause and victim of a global chronic inflammation

- Anthropocentrism
- Capitalism
- Speciesm
- Abuse of natural resources
- Social gradient & inequity
Anthropogenic disaster by a few powerful greedy, myopic psychopaths
Corporate influence in Europe Decision Making

2023: Despite the facts EU keeps extending the use of glyphosate

- CYP450 inhibitor
- Cancer
- Dysbiosis / microbiome unbalance
- Autism

Monsanto fined $289 million for failing to warn users of glyphosate-cancer link

In the first of many pending trials in the US, a California jury has ruled that the herbicide glyphosate (Roundup) can cause cancer.
Cancer incidence on the rise (in all age groups)

Source: CDC
Nature and Nurture: The underprivileged always more vulnerable

Tuberculosis: Paradigm of Social disease
1/3 of the global population is infected. Who gets sick?

New data shows COVID-19's disproportionate impact on American Indian, Alaska Native tribes

Johns Hopkins Coronavirus Resource Center, Center for American Indian Health launch visualization of pandemic spread within Tribal Nations
Nature and Nurture: Map of obesity, diabetes, heart disease and poverty in the US
Nature and Nurture: 20000+ children die daily victims of Social diseases

- Human Trafficking
- Contaminated Water
- Malnutrition
- Cholera
- Drug abuse
- Prostitution
- Chagas
- Tuberculosis
- Child Labour
- War
- Family Violence
- Malaria
- HIV /AIDS
Animal experimentation: A cruel business lost in translation

Kidnapping, hurting and killing sentient beings is not science

- “Humans are not 70-kg mice” (Leist, Hartung)
- Over 96% trials result in failure
- $\approx 100\%$ failure in neurodegenerative conditions
- Lost in translation from preclinical animal trials to human.
- 3Rs (Replace, Reduce, Refine) has failed

See: https://www.gnusolidario.org/animalrights/petition-free-beagles.html
Spain sets record of animal cruelty and violence against women

Un comienzo de año trágico con cuatro mujeres asesinadas en un día dispara las alarmas de la violencia machista

Tras un diciembre con cifras récord, enero arranca con una jornada negra que provoca concentraciones en diversas localidades y llamadas a renovar el pacto de Estado

elpais.com
Compassionate Science, Sustainable Planet

- **Respect**
  - Mother nature, animals (human and non-human)

- **Research**
  - Medicine, exposomics, Agriculture, Social sciences, urbanism...

- **Education**
  - People, patients, health prof, Politicians...

- **Collaboration**
  - Open Science, Free Software, Local capacity building
Respect: “First, do no harm”

Primum non nocere

Respect
Mother nature, animals
(human and non-human)
We use ethical, human relevant alternatives to animal experimentation

NAMs

- New Approach Methodologies
- Human relevant
- Ethical
- Affordable
- Dynamic
- Specific to individual / context

From Petri Dishes to Organ on Chip Platform: The Increasing Importance of Machine Learning and Image Analysis

Support cruelty-free, human relevant research

Respect
Education and reaching out

First GNU Solidario project. Santiago del Estero, Argentina 2006
Education: Working with academic & research institutions
The Stiletto Project
A Computational Model of the Cerebral Perforating Arteries in Health and Disease

- Role of exposome in Small Vessel Disease, cognitive impairment & dementia
- Multi-disciplinary project
- Tiny cerebral arteries (µm) critical in cerebral homeostasis
- Brain microcirculation and the neurovascular unit (NVU)
- Cruelty-free research (no animal models)
- Open Science for education and research

STILETTO
A computational model of the cerebral perforating arteries in health and disease
Data collection and aggregation from institutions and individuals
The Global Exposome Project

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Collaboration: GNUHealth Federation

Information gathered from participating institutions across the globe. Statistics, validation...

Open Science: Researchers and Scientists from around the world will be able to participate

Improve quality of care
From Medical imaging, laboratory and genomics to Socioeconomic and lifestyle information

The person is an active player in the system of health

Using GPL license saves millions of euros and boosts collaboration for the betterment of our health systems.
GNU Solidario around the world
Collaboration: Building local capacity and autonomous communities
Collaborating through Open Science & Free Software
Public Administration adoption

Collaboration

GNU Health Conference 2023
Leibniz University, Hanover, Sept 29-30

The Global Exposome Project
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Thank you!

https://www.gnusolidario.org