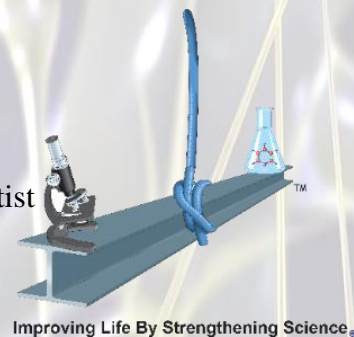


**Richard Guadalupe McDonald, Ph.D.**  
Improving Life By Strengthening Science®  
Applications Scientists & Principal Research Scientist  
38,250 flight lab hours [on diverse protocols]

[mcdonald@ghsii.org](mailto:mcdonald@ghsii.org)

U.S. Citizen [born in Washington, D.C.]  
U.S. Army Veteran [E4 & Captain]



**Principal Research Scientist & Applications Scientist.** Involvement in very high-risk interdisciplinary projects, experienced in clinical research, applications scientist, research analysis, risk mitigation, R&D, change management, virtual collaborations, flexibility, protocol design, systemization, technical literacy, and prototyping & prototyping.

**From a global viewpoint:** 15+ years as an Applications Scientists & Principal Research Scientist with extensive firsthand experience in cellular biology, synthetic biology, molecular biology, inorganic/organic chemistry, protein chemistry, physics, neurology.

**From a midlevel viewpoint:** experience in cancer; AIDS; Rare Earth Elements; neurology research; Nuclear, Biological, & Chemical Defense; POL Analysis; and field water purification.

**From a lab & field viewpoint:** (a) proprietary cell line development [T-cells and monocyte-derived macrophages] from primary cells, mostly from humans and on occasion from non-human primates], cell line banking, cell line in-vivo/ex-vivo assay development; (b) Class 1000 Metal-Free Clean Room and BLS2 facilities; (c) laser work; (d) microcircuits; (e) 3D modeling and 3D printing & CNC; (f) X-Ray Diffraction; (g) MC-ICP-MS; (h) microscope work [Light, Confocal, TEM, SEM-EDS, AFM, Stereofluorescence, Ion Beam Deposition]; (i) QA/QC, SOP, ESP [Emergency Safety Procedures], White Papers, and One-Page Proposals; (j) English to Spanish translation for medical and biomedical purposes, this includes technical lectures/seminars and simultaneous interpretations; (k) held Top Security Clearance; (l) Uranium Isotope Chemistry; and (m) coding.

#### **CONTINUAL IMPROVEMENT BY BUILDING NEW MODELS:**

**Pioneered** a synthetic biology process and a novel protein purification process enabling the production of HIV-1 protease protein for drug and vaccine studies [*European Journal of Biochemistry*].

**Pioneered** a process to fix frameshift errors during the cloning process [currently proprietary].

**Pioneered** a process that showed a cell can be infected by multiple and diverse viruses [*Journal of Cellular Biochemistry*].

**Pioneered** a statistical analysis that better predicts clinical outcomes with AIDS vaccines [or other RNA viruses] early in the process [*Journal of Human Virology*].

**Pioneered** a direct sequencing of genomic DNA without cloning [currently proprietary].

**Pioneered** an intact full-length cloning of the HIV-1 glycoprotein [gp160] for vaccine purposes; also adaptable to other RNA viruses [*Journal of Virological Methods*].

**Pioneered** a field multiplexing using biowarfare agents *Coxiella burnetti*, *Yersina pestis*, *Bacillus anthracis*, *Brucella melitensis* [*Military Medicine*].

**Pioneered** a process to rescue culture cells [primary or neoplastic cell lines] that were either not stored or processed properly, pre-seeding stage [currently proprietary].

**Discovered** huge deposits of Rare Earth Elements 100+ miles down the river, as the result of the King Gold Mine 2015 spill, giving rise to unknown environmental issues and shows mining holding ponds enriched with Rare Earth Elements.

**Currently**, have 8 active trademarks with the U.S.P.T.O.

In 2014, published in peer-reviewed journal [*Technology, Transfer and Entrepreneurship*] 11 pages on Science Ph.D./Post-Doc ADVISORS for the 21st Century.

Finally, still searching for *et al.* [*Science*]

#### **AWARDS, MEMBERSHIPS, ETC. RESULTS FROM STRATEGIES I & II:**

- 2 National Science Foundation I-Corps grants
- 1 Stanford (University) Rebuild [Participant]
- 1 Foster Innovation Grant
- 2 National Institutes of Health Research Fellowships
- 1 Meritorious Service Medal [U.S. Army: fieldwork]
- 2 Commendation Medals [U.S. Army: fieldwork, cancer management]
- 3 Army Achievement Medal [U.S. Army: 2-fieldwork, 1-diplomatic accomplishments]
- 1 National Defense Service Medal [U.S. Army]
- 6 National Institutes of Health Minority Biomedical Research Sciences Fellowships
- 1 National Committee for Employer Support of the National Guard and Reserve Award
- 8 active trademarks with the U.S.P.T.O.
- 1 New Mexico Small Business Association (NMSBA) completed grant: in partnership with AUI, inc. and experts from Los Alamos National Laboratory.
  
- Member of the Society for Applied Spectroscopy: 2019-present
- Member of the Science Advisory Board (Evaluate current/emerging technologies): 2001-Present
  
- Fluent in Spanish [writing, reading, speaking]
- Coined new terms: Military Medicine, Journal of Virological Methods (2005), Journal of the American Osteopathic Association (2x)

#### **EXPERIENCE:**

- **Principal Research Scientist & Applications Scientist:** Global Health Science Institute<sup>®</sup>, 2011-present. Biomedical development [cancer, AIDS, environmental, neurology]: neoplastic cell lines, primary cell lines, genetics, human brain work, Rare Earths Elements, microcircuits.
- **Peer Reviewer:** Defense Threat Reduction Agency Joint Science and Technology Office, Office for Chemical and Biological Defense. Grant reviewer on R&D grants related to biowarfare defense [from devices to non-human primates proposed studies].
- **Product Development Associate Director and Senior Principle Scientist,** GenoVar Diagnostics [UK]. Proprietary product R&D. ISO9001 facility.
- **Senior Biomedical Research Scientist,** Walter Reed Army Institute of Research. HIV-1 research [Molecular Virology], cell lines, patient clinical trial samples.

- **Field Scientist, Microbiology Group**, 520th Theater Army Medical Laboratory [520<sup>th</sup> TAML] (Chemical Radiological, Biological, and Nuclear [CRBN]). Part of the Microbiology [Biological] subgroup. Field genetics [multiplexing] and disease outbreak prevention.
- **Congressional Special Project Officer**, Congressionally Directed Medical Research Programs. Cancer program management, intellectual property suggestions from final grant reports, techniques [cell lines, genetics, statistical validation], annual/final grant progress evaluations, and oversaw diverse science and medical fields on grant review committees.
- **Infectious Disease Research Virologist**, Walter Reed Army Institute of Research. HIV-1: Molecular Virology research and vaccine development/evaluation. Trouble-shooting others' vaccine work and culturing issues.
- **Molecular Virology & Cellular Biology Associate Scientist**, Henry M. Jackson Foundation. HIV-1: human brain, primate-to-human, mother-fetus, neoplastic research.
- **Molecular Biology Researcher**, Advanced Biosciences Laboratory. HIV-1 R&D. Trouble-shooting cellular and molecular biology problems.
- **AIDS Vaccine Researcher**, Primate Research Institute, Holloman Air Force Base. HIV-1 R&D and vaccine development. Converted BSL3 to a BSL2.
- **Research Fellow**, National Institutes of Health (NIH), National Cancer Institute, Department of Cancer Biology and Diagnosis. Cancer and HIV-1 research = synthetic biology and protein chemistry.

#### **EDUCATION:**

- **Ph.D.** AIDS research [302 pages: gp160 work on maternal-fetal transmission, brains from patients, PBMCs from patients, a chimp, an infected lab worker, and neoplastic cell lines]. Primary advisors: Drs. Mikulas Popovic and [final] Suzanne Gartner. Molecular Biology Program, New Mexico State University. Created a one-off virology course [different viral infections on one cell] to learn how to use the Transmission Electron Microscope [TEM]; result = *Journal of Cellular Biochemistry*.
- **B.S.** Microbiology. Research with the departments of Pharmacology, Chemistry, and Biochemistry. University of Michigan.

#### **CONTINUING MEDICAL SCIENCE EDUCATION:**

- (a<sub>i</sub>) **on-campus courses** [New Mexico State University]—Molecular Biology 550 Core Microscopes, Chemistry 521 Spectrochemical Analysis (Instrument Building), Chemistry 629 Advanced Topics in Analytical Chemistry, Physics 520 X-Ray Diffraction, Biology 590 Advanced Neurobiology: Disorders of the Nervous System;
- (a<sub>ii</sub>) **on-campus courses** [Doña Ana Community College]—Drafting 109 Computer Drafting Fundamentals, Automation & Manufacturing Technology 265 Electro Mechanical Systems; Introduction to Solid Modeling, Modeling and Animation;
- (b) **on-line courses** [Udemy/Interesting Engineering Shop/Programming Electronics Academy]—Python & Java for dark-lab [IoT] purposes, C++ for Arduino prototyping purposes, Linux for supercomputer purposes, LabView/MatLab for the above purposes [and simulations], Story Telling, Operations Management [Kellogg School of Management professor], Digital Marketing [Neil Patel]; and
- (c) Course on Patent Law for Managers, Engineers, and Scientists. The Center for Professional Advancement.

## SELECTED PUBLICATIONS

(95% of work is proprietary as not in academia  
and does not include *manuscripts in preparation*):

- *Journal of Selected Topics in Quantum Electronics* 23(3): 7100105, 5 pages (2017). Z Yang, B Rutherford, **R McDonald**, JP Houston. Development of far-red and ultraviolet digital frequency-domain flow cytometry systems.
- *Technology, Transfer and Entrepreneurship* 1(1):40-50 (2014). **R McDonald**. Science Ph.D. and Science Postdoctoral Advisors for the 21st Century: A Path to Successful Technology.
- *Journal of the American Osteopathic Association* 113(4):268-270 (2013). **R McDonald**. Impact Indices Shed False Light.
- *MIT Technology Review* June, p.8 (2010). **R McDonald**. How Academics Hinder Innovation.
- *Science* 315:940 (2007). **R McDonald**. Who Is et al.? [Article referenced #4 in German legal article <http://germarrudolf.com/wp-content/uploads/2012/04/VerdictAnalysis.pdf>, and in the first sentence of a European cardiology journal <https://www.yumpu.com/es/document/view/9681329/tnw2yr>]
- *Obstetrics & Gynecology* 109:1458-1459 (2007). V Burnett and **R McDonald**. Human Uterus Retrieval from a Multiorgan Donor.
- *Journal of Virological Methods* 126:111-118 (2005). **R McDonald** and V Burnett. Novel Single-Round PCR and Cloning of Full-Length Envelope Genes of HIV-1 May Yield New Insight into Biomolecular Antibacterial Drug Development. First paper to accomplish breakthrough, as determined by subject tracker BioMedLib...first 5-year comparison: <http://globalhealthscienceinstitute.org/graphics/BioMedLib%20Analysis%20of%20Publication.pdf>
- *Military Medicine* 168:iii (2003). **R McDonald**. Wrong Conclusion on Excess Water Consumption in the Field.
- *Military Medicine* 166:237-239 (2001). **R McDonald**, T Cao, R Borschel. Multiplexing for the Detection of Multiple Biowarfare Agents Shows Promise in the Field. [Pioneered field multiplexing (*Coxiella burnetti*, *Yersina pestis*, *Bacillus anthracis*, *Brucella melitensis*).]
- *Journal of Human Virology* 4:179-187 (2001). **R McDonald**, G Chang, NL Michael. Relationship Between V3 Genotype, Biologic Phenotype, Tropism, and Coreceptor Use for Primary Isolates of Human Immunodeficiency Virus Type 1.
- *In: Methods in Molecular Medicine*. Humana Press (1999), Chapter 9:61-69. **R McDonald**. Southern Blotting.
- *In: Methods in Molecular Medicine*. Humana Press (1999), Chapter 10:71-81. **R McDonald** and CAD Smith. Northern Blotting.
- *Journal of Virology* 71:1871-1879 (1997). **R McDonald**, DL Mayers, RCY Chung, KF Wagner, S Ratto-Kim, DL Birx, NL Michael. Evolution of Human Immunodeficiency Virus Type 1 env Sequence Variation in Patients with Diverse Rates of Disease Progression and T-Cell Function.
- *Journal of Human Virology* 1:3-18 (1997). S Gartner, **R McDonald**, EA Hunter, F Bouwman, Y Liu, M Popovic. Gp120 Sequence Variation in Brain and in T-lymphocyte Human Immunodeficiency Virus Type 1 Primary Isolates.
- *Journal of Cellular Biochemistry* 17E(Q234) (1993). **R McDonald**, H Adams, C Brown, EA Hunter, Y Liu, S Gartner. HIV-1 or HTLV-I and Spumaretrovirus Can Be Expressed Concomitantly from the Same Cell.
- *European Journal of Biochemistry* 199:361-369 (1991). JM Louis, **R McDonald**, NT Nashed, EM Wondrak, DM Jerina, S. Oroszlan, PT Mora. Autoprocessing of the HIV-1 Protease

Using Purified Wild-Type and Mutated Fusion Protein Expressed at High Levels in Escherichia coli. Revolutionized a protein purification process helping drug discovery and drug improvements against HIV-1 using synthetic biology.

### **Secondary Publications**

- Diabetes Forecast, June, p.10 (2007). **R McDonald**. Exercise and heart rate fallacies.
- Business 2.0, July, p. 13 (2007). **R McDonald**. Potential problem with iron shavings to restore plankton levels.
- Science Advisory Board, (2006). **Richard McDonald**. Study snapshot: Biodefense: Research Opportunities and Challenges in 2006 Federal Biodefense Research Priorities.  
<http://www.globalhealthscienceinstitute.org/graphics/Biodefense.pdf>
- Science Advisory Board, (2006). **Richard McDonald**. Study snapshot: Custom Oligos: Is Screening for Bioterrorist Threats Possible?  
[http://www.globalhealthscienceinstitute.org/graphics/Custom\\_Oligos.pdf](http://www.globalhealthscienceinstitute.org/graphics/Custom_Oligos.pdf)
- Bioterrorism Preparedness: A Field Manual for Modern Bioterrorism Survival: Module 13-- Spread of Disease and Infection Control (for FEMA 2000). **R McDonald**.