
BIOGRAPHICAL SKETCH

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NAME Frederico G. S. de Toledo, MD	POSITION TITLE Associate Professor of Medicine Director, Endocrinology & Metab. Research Center		
eRA COMMONS USER NAME (credential, e.g., agency login) FSTOLEDO			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Universidade Federal do Rio de Janeiro, Brazil	M.D.	1990-1996	Medicine
Mayo Clinic, MN	Postdoc fellowship	1996-1998	Calcium signaling and renal physiology
University of Miami, FL	Residency	1999-2002	Internal Medicine
University of Pittsburgh, PA	Fellowship	2002-2004	Endocrinology and Metabolism

A. PERSONAL STATEMENT

My contribution to this application is based on my experience both as clinical investigator and educator. My research is focused on the fields of glucose metabolism, insulin resistance and diabetes. Since 2003 my research studies have been employing sophisticated methods to study human metabolism in vivo. Examples include euglycemic clamps, FSIVGTT, indirect calorimetry, stable-isotope tracers to measure substrate turnover in vivo (6,6-D₂-glucose, 1-¹³C-palmitate and U-¹³C-palmitate), body composition methods (DEXA, CT), muscle and fat biopsies, and stereological methods for quantitative electron microscopy. I have been a Principal Investigator in clinical research studies sponsored by the NIH, American Diabetes Association, and the Dept. of Defense. I have mentored fellows in research projects and contributed to the educational mission of our Division as Associate Fellowship Director, having been regularly involved in the steering of educational initiatives of research training. I am looking forward to participate in the renewal phase of this T32.

B. POSITIONS AND HONORS

Positions and employment:

2004-07 Instructor of Medicine, Div. Endocrinology & Metabolism, U. Pittsburgh, PA
2007-14 Assistant Professor of Medicine, Div. Endocrinology & Metabolism, U. Pittsburgh
2013-- Director, Endocrinology and Metabolism Research Center, Univ. Pittsburgh
2014-- Associate Professor of Medicine, Div. Endocrinology & Metabolism, U. Pittsburgh

Other Experience

2005-14 Associate Program Director, Endocrinology and Metabolism Fellowship Program
2006--- Peer reviewer: Diabetes, Diabetes Care, JCEM, Nature Reviews, Obesity, PLOS and others
2006-11 Grant reviewer, ad hoc: American Diabetes Association
2011 Grant reviewer, ad hoc: Ireland's Health Research Board
2007-11 Member, Scientific Advisory Committee, Clin. Transl. Res. Ctr. (CTRC), U. Pittsburgh
2009-13 Director, Telemedicine Diabetes Program, Div. Endocrinology and Metabolism
2011 NIH Study Section grant reviewer: NHLBI Study section
2011 Chair, oral posters session, American Diabetes Association Scientific Sessions
2012 Reviewer, Abstracts Selection Committee, ADA Scientific Sessions
2013 Chair, symposium session; American Diabetes Association Scientific Sessions

Honors:

2001 Best Clinical Report Award, Am. College of Physicians

2002 The Eric Reiss Award, Dept. of Medicine, University of Miami.

Membership in professional societies:

2002--- Endocrine Society
2004--- American Diabetes Association
2006--- European Association for the Study of Diabetes

B. PEER-REVIEWED PUBLICATIONS

Selected from a total of 66 manuscripts

1. **Toledo FGS**, Kelley DE. Mitochondrial dysfunction in the pathogenesis of insulin resistance associated with obesity, diabetes, and aging. *Current Opinion in Endocrinology, Diabetes and Obesity*. 2005;12(2):157-62.
2. **Toledo FG**, Sniderman AD, Kelley DE. Influence of hepatic steatosis (fatty liver) on severity and composition of dyslipidemia in type 2 diabetes. *Diabetes Care*. 2006;29(8):1845-50. Epub 2006/07/29. doi: 10.2337/dc06-0455. PubMed PMID: 16873790.
3. **Toledo FG**, Watkins S, Kelley DE. Changes induced by physical activity and weight loss in the morphology of intermyofibrillar mitochondria in obese men and women. *J Clin Endocrinol Metab*. 2006;91(8):3224-7. Epub 2006/05/11. doi: 10.1210/jc.2006-0002. PubMed PMID: 16684829.
4. **Toledo FG**, Menshikova EV, Ritov VB, Azuma K, Radikova Z, DeLany J, Kelley DE. Effects of physical activity and weight loss on skeletal muscle mitochondria and relationship with glucose control in type 2 diabetes. *Diabetes*. 2007;56(8):2142-7. Epub 2007/05/31. doi: 10.2337/db07-0141. PubMed PMID: 17536063.
5. **Toledo FG**, Menshikova EV, Azuma K, Radikova Z, Kelley CA, Ritov VB, Kelley DE. Mitochondrial capacity in skeletal muscle is not stimulated by weight loss despite increases in insulin action and decreases in intramyocellular lipid content. *Diabetes*. 2008;57(4):987-94. Epub 2008/02/07. doi: 10.2337/db07-1429. PubMed PMID: 18252894.
6. Coen PM, Dube JJ, Amati F, Stefanovic-Racic M, Ferrell RE, **Toledo FG**, Goodpaster BH. Insulin resistance is associated with higher intramyocellular triglycerides in type I but not type II myocytes concomitant with higher ceramide content. *Diabetes*. 2010;59(1):80-8. Epub 2009/10/17. doi: 10.2337/db09-0988. PubMed PMID: 19833891; PubMed Central PMCID: PMC2797948.
7. Mihalik SJ, Goodpaster BH, Kelley DE, Chace DH, Vockley J, **Toledo FG**, DeLany JP. Increased levels of plasma acylcarnitines in obesity and type 2 diabetes and identification of a marker of glucolipototoxicity. *Obesity (Silver Spring)*. 2010;18(9):1695-700. Epub 2010/01/30. doi: 10.1038/oby.2009.510. PubMed PMID: 20111019.
8. Chomentowski P, Coen PM, Radikova Z, Goodpaster BH, **Toledo FG**. Skeletal muscle mitochondria in insulin resistance: differences in intermyofibrillar versus subsarcolemmal subpopulations and relationship to metabolic flexibility. *J Clin Endocrinol Metab*. 2011;96(2):494-503. Epub 2010/11/26. doi: 10.1210/jc.2010-0822. PubMed PMID: 21106709; PubMed Central PMCID: PMC3048328.
9. Triay J, Mundi M, Klein S, **Toledo FG**, Smith SR, Abu-Lebdeh H, Jensen M. Does rimonabant independently affect free fatty acid and glucose metabolism? *J Clin Endocrinol Metab*. 2012;97(3):819-27. Epub 2011/12/16. doi: 10.1210/jc.2011-2486. PubMed PMID: 22170727; PubMed Central PMCID: PMC3319222.
10. Coen PM, Hames KC, Leachman EM, DeLany JP, Ritov VB, Menshikova EV, Dube JJ, Stefanovic-Racic M, **Toledo FG**, Goodpaster BH. Reduced skeletal muscle oxidative capacity and elevated ceramide but not diacylglycerol content in severe obesity. *Obesity (Silver Spring)*. 2013;21(11):2362-71. doi: 10.1002/oby.20381. PubMed PMID: 23512750.

11. Coen PM, Jubrias SA, Distefano G, Amati F, Mackey DC, Glynn NW, Manini TM, Wohlgemuth SE, Leeuwenburgh C, Cummings SR, Newman AB, Ferrucci L, **Toledo FG**, Shankland E, Conley KE, Goodpaster BH. Skeletal muscle mitochondrial energetics are associated with maximal aerobic capacity and walking speed in older adults. *J Gerontol A Biol Sci Med Sci.* 2013;68(4):447-55. Epub 2012/10/12. doi: 10.1093/gerona/gls196. PubMed PMID: 23051977; PubMed Central PMCID: PMC3593613
12. **Toledo FG**, Goodpaster BH. The role of weight loss and exercise in correcting skeletal muscle mitochondrial abnormalities in obesity, diabetes and aging. *Molecular and cellular endocrinology.* 2013;379(1-2):30-4. doi: 10.1016/j.mce.2013.06.018. PubMed PMID: 23792186.
13. **Toledo FG**. Mitochondrial involvement in skeletal muscle insulin resistance. *Diabetes.* 2014;63(1):59-61. doi: 10.2337/db13-1427. PubMed PMID: 24357699.
14. Courcoulas AP, Goodpaster BH, Eagleton JK, Belle SH, Kalarchian MA, Lang W, **Toledo FG**, Jakicic JM. Surgical vs Medical Treatments for Type 2 Diabetes Mellitus: A Randomized Clinical Trial. *JAMA Surg.* 2014;149(7):707-15. doi: 10.1001/jamasurg.2014.467. PubMed PMID: 24899268; PubMed Central PMCID: PMC4106661.
15. DeLany JP, Dube JJ, Standley RA, Distefano G, Goodpaster BH, Stefanovic-Racic M, Coen PM, **Toledo FG**. Racial Differences In Peripheral Insulin Sensitivity And Mitochondrial Capacity In The Absence Of Obesity. *J Clin Endocrinol Metab.* 2014;jc20142512. Epub 2014/08/12. doi: 10.1210/jc.2014-2512. PubMed PMID: 25105736.

C. RESEARCH SUPPORT:

Active

Rediscovering Hydroxychloroquine as a Novel Insulin Sensitizer
 American Diabetes Association (**Toledo**) 07/01/13 – 06/30/16
 Role: Principal Investigator
 Goal: to identify mechanisms and target tissues behind the effects of hydroxychloroquine on glucose metabolism in humans

Decreased Fat Oxidation - Metabolic Inflexibility in African-American Women
 NIH R01 DK091462-01 (DeLany) 07/01/11 - 05/13/15
 Role: Co-Investigator
 Goal: To determine the determinants of fatty acid oxidation rates in African-American and Caucasian women and their relationship to insulin resistance.

Mechanisms of Action of Hydroxychloroquine in Reducing Risk of Type 2 Diabetes
 NIH-NIDDK 1R21DK082878-01A1 (**Toledo**) 09/08/10 - 05/31/15
 Role: Principal Investigator
 Goal: to obtain preliminary data in support of the physiological mechanisms by which hydroxychloroquine lowers blood glucose and assess its potential use as a drug for prevention of diabetes.

Recently Completed

An open label Phase I dose escalation study to evaluate the safety, tolerability, pharmacokinetics, maximum tolerated dose and biomarker response after intravenous administration of weekly BAY 80-6946 to patients with advanced cancer
 Bayer Protocol Number BY-12871 (Appleman) 03/01/10 - 02/28/14
 Role: Co-Investigator

Goal: This is a phase I study to evaluate the therapeutic potential of the PI-3 kinase inhibitor BAY 80-06946. In addition to pharmacokinetics and safety, the effects on glucose metabolism will be examined.

Skeletal Muscle Lipid and Insulin Resistance in Aging
NIH 2 R01 AG021961-05A1 (Goodpaster)

09/30/11 - 08/31/13

Role: Co-Investigator

Goal: to investigate the effects of weight loss/exercise on muscle lipids and oxidative capacity in the elderly

A New Diabetes Care Model Combining Telemedicine Technology and Patient Self-Management Skills
Department of Defense FA7014-10-2-0005 (**Toledo**)

10/01/10 - 05/31/12

Role: Principal Investigator

Goal: to test the efficacy of a novel diabetes care delivery model that combines Telemedicine technology, patient self-management and nurse empowerment.

A pilot study to evaluate the accuracy of plasma glucose estimation by the BodyMedia Armband Device
BodyMedia Inc. (**Toledo**)

06/01/09 - 06/30/12

Role: Principal Investigator

Goal: This is an investigator-initiated study to explore the potential of development of a new device capable of estimating blood glucose non-invasively.

Physical Activity Following Surgery-induced Weight Loss

NIH 1 RO1 DK0781920-01A1

12/01/07 - 01/30/13

Role: Co-Investigator (Goodpaster)

Goal: to investigate the potential additive role of exercise after bariatric surgery upon energy balance, efficiency of fat oxidation by muscle and mitochondrial oxidative capacity.

A Randomized Trial to Compare Surgical and Medical Treatments for Type 2 Diabetes

NIH 1RC1DK086037-01 (Courcoulas)

09/30/09 - 09/29/11

Role: Co-investigator

Goal: this project will gather pilot data to test the feasibility of randomizing patients to lifestyle changes vs. bariatric surgery for an eventual larger trial and will examine weight loss outcomes.

Victoria Trial

Sanofi-Aventis (**Toledo**)

04/01/06 - 03/31/11

Role: Principal Investigator

Goal: to study whether rimonabant reduces intra-abdominal fat and improves adipocyte physiology

Prediction and Prevention of Type 1 Diabetes (TrialNet)

NIH 5 U01 DK061055-06 (D. Becker)

09/29/01 - 08/31/09

Role: Co-Investigator

Goal: To investigate novel strategies to prevent and treat type-1 diabetes.

INSPIRE ME IAA

Sanofi-Aventis (**Toledo**)

01/01/08 - 06/01/08

Role: Principal Investigator

Goal: to investigate the relationship between visceral adiposity and incidence of cardiovascular disease and type-2 diabetes mellitus.