

BIOGRAPHICAL SKETCH

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NAME: Minko, Tamara

eRA COMMONS USER NAME (credential, e.g., agency login): TMINKO

POSITION TITLE: Distinguished Professor and Chair, Department of Pharmaceutics

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Mordovsky State University, Russia	M.S. (Honor)	06/77	Biochemistry
Institute of Physiology, Ukrainian Academy of Sciences, Ukraine	Ph.D.	10/84	Physiology (Molecular & Cellular)
University of Utah, Salt Lake City, Utah	Postdoc	12/96	Molecular & Cellular Biology
University of Utah, Salt Lake City, Utah	Postdoc	08/98	Pharmaceutics & Pharm. Chemistry

A. Personal Statement

I have strong experience in the areas of drug delivery, nanomedicine, treatment and imaging of different types of cancers and lung diseases including ovarian, pancreatic, lung and triple negative breast cancers, pulmonary and cystic fibrosis, acute respiratory distress syndrome, etc. With my background in biochemistry, molecular and cellular biology, physiology, pharmaceutics and nanotechnology, I believe that I have the required expertise to participate in this proposal. I am a Distinguished Professor and Chair of the Department of Pharmaceutics at Rutgers, The State University of New Jersey, member of the Cancer Institute of New Jersey and Environmental and Occupational Health Sciences Institute. I am an author and co-author of more than 400 publications (peer-reviewed papers, books and textbook chapters, conference proceedings/abstracts and patents). Many of my papers are well cited and published in prestigious journals with high impact factors including PNAS, Nature Nanotechnology, Cancer Research, Clinical Cancer Research, Advanced Drug Delivery Review, Journal of Controlled Release, Small, ACS Nano, etc. My Hirsch factor is 66; papers have been cited 18,755 times and regularly highlighted by different sources. I am a Past President of Controlled Release Society (CRS), an elected Fellow of three organizations: CRS, American Association of Pharmaceutical Scientists (AAPS), and American Institute for Medical and Biomedical Engineering (AIMBE); recipient of numerous awards, Executive Editor of *Advanced Drug Delivery Reviews*, Editor of *Pharmaceutical Research*, member of editorial board of ten scientific journals, and a member of Study Sections at NIH, DOD, American Heart Association and other national and international review panels. My research is supported by grants from NIH, NSF and other national and international sources. We have developed orthotopic mouse models for a number of diseases including ovarian cancer. I have had demonstrated a record of successful and productive research projects important for the whole area of pharmaceutics, cancer targeted drug delivery and nanomedicine, specifically in fabricating and characterizing nanocarriers for targeted treatment of cancers. I have an extensive experience in the development and testing of various nanotechnology-based systems for the delivery of pharmaceutics including therapeutic nucleic acids. I am well prepared to bring this project to success and will enthusiastically provide all the necessary support to successfully achieve proposal's objectives. In summary, I have the background, expertise and motivation necessary to help in successfully carrying out the proposed research project.

Ongoing and recently completed projects that I would like to highlight include:

Ongoing Research Support

R01 CA269513
Minko (PI)
06/01/2022 – 05/31/2027
Nanotechnology-based personalized treatment of metastatic ovarian cancer

R01 CA238871
Minko (PI)
04/01/19 – 03/31/24
Bionanotechnology approach for treatment of lung cancer

R01 CA209818
Minko (PI)
04/21/17 – 03/31/22
Tumor-targeted nanoparticle-based delivery system for imaging and treatment of cancer

R01 CA251438
Hatefi (PI), Role: Co-I
04/01/21 – 03/31/26
Stem cell-based platform for targeted enzyme/prodrug therapy of recurrent ovarian cancer

R01 CA233897
Cartegni (PI), Role: Co-I
12/01/18 – 11/30/24
Targeting refractory EGFR-driven tumors by induction of dominant-negative EGFR splicing variants

Selected Completed Research Support

R01 HL118312
Minko (PI)
01/01/14 – 12/31/19
Nanotechnology approach for inhalation treatment of pulmonary fibrosis

R01 CA138533
Minko (PI)
07/01/10 – 06/30/16
Multifunctional nanotherapeutics for cancer treatment and imaging

R01 CA 111766
Minko (PI)
04/07/06 – 02/28/13
NIH/NCI
Molecular targeting of drug delivery system to cancer

Overlap: None

Citations:

1. Garbuzenko, O.B., Saad, M., Pozharov, V.P., Reuhl, K.R., Mainelis, G., Minko, T. (2010). Inhibition of lung tumor growth by complex pulmonary delivery of drugs with oligonucleotides as suppressors of cellular resistance. *Proc Natl Acad Sci U S A*, 107(23): 10737-10742. PMID: 20890783.
2. Zhang, M., Garbuzenko, O.B., Reuhl, K.R., Rodriguez-Rodriguez, L., Minko, T. (2012). Two-in-one: combined targeted chemo and gene therapy for tumor suppression and prevention of metastases. *Nanomedicine (Lond)* 7(2), 185-197. PMID: 22339132.
3. Shah, V., Taratula, O., Garbuzenko, O.B., Taratula, O.R., Rodriguez-Rodriguez, L., Minko, T. (2013). Targeted nanomedicine for suppression of CD44 and simultaneous cell death induction in ovarian cancer: an optimal delivery of siRNA and anticancer drug. *Clin Cancer Res* 19(22), 6193-6204. PMID: 23846837.

4. Sapiezynski, J., Taratula, O., Rodriguez-Rodriguez, L., Minko, T. (2016). Precision targeted therapy of ovarian cancer. *J Control Release* 243, 250-268. PMC: PMC5191987.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

- 2011-Present Distinguished Professor, Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, The State University of New Jersey, Piscataway, NJ
- 2008-Present Chair, Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, The State University of New Jersey, Piscataway, NJ
- 2008-2009 Acting Director, Graduate Program in Pharmaceutical Science, Rutgers University, NJ
- 2007-2011 Professor, Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, The State University of New Jersey, Piscataway, NJ
- 2003-2007 Associate Professor, Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, The State University of New Jersey, Piscataway, NJ
- 2000-Present Member, Rutgers Cancer Institute, Environmental and Occupational Health Sciences Institute
- 2000-2003 Assistant Professor, Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, the State University of New Jersey, Piscataway, NJ
- 1997-2000 Research Associate/Research Assistant Professor, Department of Pharmaceutics and Pharmaceutical Chemistry, School of Pharmacy, University of Utah, Salt Lake City, Utah
- 1994-1996 Senior Research Specialist, Department of Cardiovascular Genetics, School of Medicine, University of Utah, Salt Lake City, Utah
- 1984-1993 Junior/Senior Scientist, Institute of Physiology, Ukrainian Academy of Sciences, Kiev, Ukraine
- 1981-1984 Ph.D. Student, Institute of Physiology, Ukrainian Academy of Sciences, Kiev, Ukraine
- 1977-1981 Lecturer, College of Nursing, Kiev, Ukraine

Other Experience and Professional Membership

- 2016-2019 President-Elect, President, Controlled Release Society (CRS)
- 2014-Present Permanent Member, NIH Peer Review Committee: Nanotechnology
- 2014-Present Member, American Institute for Medical and Biomedical Engineering (AIMBE)
- 2014-Present Executive Editor, *Advancer Drug Delivery Reviews*
- 2012 Chair of Organizing Committee, 10th International Nanomedicine and Drug Delivery (NanoDDS'12) Symposium, Atlantic City, NJ
- 2010-2014 Ad Hoc Reviewer, Different NIH Peer Review Committees
- 2009 Program Chair, 36th International Annual Meeting of the CRS, Copenhagen, Denmark
- 2008-Present Editor, *Pharmaceutical Research*
- 2006-2010 Permanent Member, NIH Peer Review Committee: BTSS
- 2006 Member, Department of Defense Peer Review Committee: Ovarian Cancer Panel #2 (OC-2)
- 2005 Conference Organizer and Chair, the Biennial New Jersey Pharmaceutical Conference
- 2002-Present Member, American Chemical Society (ACS)
- 2000-Present Member, Editorial Boards of 10 Scientific Journals
- 1999-Present Member, American Association of Pharmaceutical Scientists (AAPS)
- 1998-Present Member, Controlled Release Society (CRS)
- 1998-Present Member, American Association of Cancer Research (AACR)

Awards and Honors

- 2022 Distinguished Service Award, Controlled Release Society (CRS).
- 2019 The Board of Trustees Award for Excellence in Research (Rutgers, the State University of NJ)
- 2019 Gallo Award for Scientific Excellence, Rutgers Cancer Institute of New Jersey for Outstanding Cancer Research.
- 2017-2018 President, Controlled Release Society
- 2015 New Jersey Health Foundation Excellence in Research Award.
- 2014-Present Elected Fellow, CRS.
- 2014-Present Elected Fellow, AIMBE.
- 2012 Most Innovative Technology Award, Rutgers, The State University of New Jersey
- 2011 Drug Delivery and Translational Research Outstanding Research Paper Award
- 2009-Present Elected Fellow, AAPS.

2009/11	The New Jersey Cancer Research Award for Scientific Excellence.
2008/10/11	CRS Outstanding Pharmaceutical Paper Awards.
2008	Gallo Award for Scientific Excellence for Outstanding Cancer Research.
2002	Award for an Outstanding Achievement from International Journal of Oncology, Oncology Reports and International Journal of Molecular Medicine.
1998	The Jorge Heller Journal of Controlled Release/CRS Outstanding Paper Award.
1988, 1993	Awards of the Biology and Theoretical Medicine Section of the Ukrainian Academy of Sciences.

C. Contribution to Science

I've made substantial contributions to the following areas:

1. A strategy for inhalation therapy of fibrosis and hypoxia was proposed and tested *in vitro* and using animal models. The approach includes a simultaneous local delivery to the lungs of prostaglandins, vitamins and inhibitors of signaling pathways of fibrosis, inflammation and hypoxia. The project was funded by NIH (R01 HL118312) and Busch Biomedical Research Grant, a patent application was filed and 16 manuscripts were published as the result of this research.
 - a. Garbuzenko O. B., Kbah N., Kuzmov A., Pogrebnyak N., Pozharov V., Minko T., Inhalation treatment of cystic fibrosis with lumacaftor and ivacaftor co-delivered by nanostructured lipid carriers, *J Control Release*, 296, 225-231 (2019), PMID: 30677435, PMC6461390.
 - b. Kuzmov, A. & Minko, T. (2015). Nanotechnology approaches for inhalation treatment of lung diseases. *J Control Release* 219, 500-518. PMID: 26297206
 - c. Ivanova, V., Garbuzenko, O.B., Reuhl, K.R., Reimer, D.C., Pozharov, V.P. & Minko, T. (2013). Inhalation treatment of pulmonary fibrosis by liposomal prostaglandin E2. *Eur J Pharm Biopharm* 84(2), 335-344. PMID: PMC3660419.
 - d. Betigeri S., Zhang M., Garbuzenko O., Minko T., Non-viral systemic delivery of siRNA or antisense oligonucleotides targeted to Jun N-terminal kinase 1 prevents cellular hypoxic damage, *Drug Deliv Transl Res*, 1, 13-24 (2011), PMID: 21461383, PMC3063508.
2. A novel concept of the treatment of lung cancer has been proposed. The innovation and uniqueness of the idea is based on the local inhalation delivery of chemotherapeutic agents in combination with oligonucleotides or siRNA in order to suppress cancer cells resistance and enhance the efficiency of the treatment. The experimental results showed high antitumor activity and low adverse side effects of proposed complex inhalatory treatment that cannot be achieved by individual components applied separately. The present work opens new horizons in treatment of lung cancer. The project was funded by NIH (R01CA111766, R01 CA238871), DoD (W81XWH-10-1-0347) and American Lung Association (LCD-23812-N; RG-156-N), resulted in the submission of a patent application and publication of 11 papers in prestigious peer-reviewed journals.
 - a. Majumder, J.; Minko, T., Multifunctional Lipid-Based Nanoparticles for Codelivery of Anticancer Drugs and siRNA for Treatment of Non-Small Cell Lung Cancer with Different Level of Resistance and EGFR Mutations. *Pharmaceutics* 13, 1063-1084 (2021), PMID: 34371754 PMC8309189.
 - b. Garbuzenko OB, Kuzmov A, Taratula O, Pine SR, Minko T. (2019). Strategy to enhance lung cancer treatment by five essential elements: inhalation delivery, nanotechnology, tumor-receptor targeting, chemo- and gene therapy. *Theranostics* 9(26), 8362-8376. PMID: 31754402.
 - c. Garbuzenko, O.B., Mainelis, G., Taratula, O. & Minko, T. (2014). Inhalation treatment of lung cancer: the influence of composition, size and shape of nanocarriers on their lung accumulation and retention. *Cancer Biol Med* 11(1), 44-55. PMC: PMC3969800.
 - d. Taratula, O., Kuzmov, A., Shah, M., Garbuzenko, O.B. & Minko, T. (2013). Nanostructured lipid carriers as multifunctional nanomedicine platform for pulmonary co-delivery of anticancer drugs and siRNA. *J Control Release* 171(3), 349-357. PMID: PMC3766401.
3. Proposed original approach of receptor-targeted combined chemo- and gene therapy suppressed the growth of primary ovarian tumor and prevented the development of intraperitoneal metastases. The project was funded by NIH (R01CA100098), New Jersey Commission on Science and Technology, Busch Biomedical Research Grant and United States Israel Binational Science Foundation (BSF, # 2005237) and resulted in the submission of a patent application and 17 papers.

- a. Yin, P.T., S. Shah, N.J. Pasquale, O.B. Garbuzenko, T. Minko, and K.B. Lee, Stem cell-based gene therapy activated using magnetic hyperthermia to enhance the treatment of cancer. *Biomaterials*, 2016. 81: p. 46-57 PMID: PMC4715938.
 - b. Minko, T., L. Rodriguez-Rodriguez, and V. Pozharov, Nanotechnology approaches for personalized treatment of multidrug resistant cancers. *Adv Drug Deliv Rev*, 2013. 65(13-14): p. 1880-95.
 - c. Saad, M., Garbuzenko, O.B., Ber, E., Chandna, P., Khandare, J.J., Pozharov, V.P. & Minko, T. (2008). Receptor targeted polymers, dendrimers, liposomes: which nanocarrier is the most efficient for tumor-specific treatment and imaging? *J Control Release* 130(2), 107-114. PMID: PMC3590109.
 - d. Dharap, S.S., Wang, Y., Chandna, P., Khandare, J.J., Qiu, B., Gunaseelan, S., Sinko, P.J., Stein, S., Farmanfarmanian, A. & Minko, T. (2005). Tumor-specific targeting of an anticancer drug delivery system by LHRH peptide. *Proc Natl Acad Sci U S A* 102(36), 12962-12967. PMID: PMC1200279.
4. Several effective nanoscale-based systems were developed and tested for the tumor-targeted delivery of siRNA in combination with hydrophilic and hydrophobic drugs. The project was funded by NIH (R01CA138533) and NSF (CBET 0933966), a patent application was filed and 16 papers were published.
 - a. Al-Mahmood S., Sapiezynski J., **Garbuzenko O. B.**, **Minko T.** (2018). Metastatic and triple-negative breast cancer: challenges and treatment options, *Drug Deliv Transl Res*, 8, 1483-1507, PMID: 29978332, PMC6133085.
 - b. Taratula, O., Garbuzenko, O.B., Kirkpatrick, P., Pandya, I., Savla, R., Pozharov, V.P., He, H. & Minko, T. (2009). Surface-engineered targeted PPI dendrimer for efficient intracellular and intratumoral siRNA delivery. *J Control Release* 140(3), 284-293. PMID: PMC2787988.
 - c. Chen, A.M., Zhang, M., Wei, D., Stueber, D., Taratula, O., Minko, T. & He, H. (2009). Co-delivery of doxorubicin and Bcl-2 siRNA by mesoporous silica nanoparticles enhances the efficacy of chemotherapy in multidrug-resistant cancer cells. *Small* 5(23), 2673-2677. PMID: PMC2833276.
 - d. Patil, M.L., Zhang, M., Betigeri, S., Taratula, O., He, H. & Minko, T. (2008). Surface-modified and internally cationic polyamidoamine dendrimers for efficient siRNA delivery. *Bioconjug Chem* 19(7), 1396-1403. PMID: 18576676
 5. Different nanotechnologies were designed, characterized and tested for treatment, imaging and clinical applications. This work contributed substantially to fundamental studies of biocompatibility, stability and toxicity problems of designed nanosystems. The research was supported by the grant from NIH (R01CA209818), several patent applications were submitted and 31 manuscripts were published as the result of this research.
 - a. Savla, R., Garbuzenko, O.B., Chen, S., Rodriguez-Rodriguez, L. & Minko, T. (2014). Tumor-targeted responsive nanoparticle-based systems for magnetic resonance imaging and therapy. *Pharm Res* 31(12), 3487-3502. PMID: PMC4224753.
 - b. Shah, V., Taratula, O., Garbuzenko, O.B., Patil, M.L., Savla, R., Zhang, M. & Minko, T. (2013). Genotoxicity of different nanocarriers: possible modifications for the delivery of nucleic acids. *Curr Drug Discov Technol* 10(1), 8-15. PMID: PMC3899095.
 - c. Geng, Y., Dalhaimer, P., Cai, S., Tsai, R., Tewari, M., Minko, T. & Discher, D.E. (2007). Shape effects of filaments versus spherical particles in flow and drug delivery. *Nat Nanotechnol* 2(4), 249-255. PMID: PMC2740330.
 - d. Khandare, J.J., Jayant, S., Singh, A., Chandna, P., Wang, Y., Vorsa, N. & Minko, T. (2006). Dendrimer versus linear conjugate: Influence of polymeric architecture on the delivery and anticancer effect of paclitaxel. *Bioconjug Chem* 17(6), 1464-1472. PMID: 17105225.

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