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Physiology & Anatomy
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Area of Expertise

A new approach involving drug delivery to cancerous breast tumors is proposed. The method involves the encapsulation of an anti-cancer agent (such as taxol [paclitaxel]) into artificial cholesterol complexes as novel delivery vehicles. These complexes resemble high density lipoproteins (good cholesterol carriers, HDL) and they markedly improve the solubility and transportability of otherwise poorly soluble drugs. The proposed studies include: Testing of the HDL/drug complexes against several breast tumor cells, by comparing their killing potential to that of the free drug and testing the efficacy of the HDL/drug preparation against breast tumors carried by mice (in vivo). Future studies would include clinical trials with appropriate formulations.

If successful, these studies will establish a new generation of chemotherapeutic agents against breast cancer and thus substantially enhance the quality of life and the survival of patients. Furthermore, the proposed formulation may provide an improved treatment modality for breast cancer as the encapsulated drug preparation is expected to have reduced toxicity against normal cells and tissues (particularly heart tissue). This approach has the potential to markedly improve the delivery of anticancer drugs to target tissues and thus improve the chemotherapy and may even provide a cure for breast cancer.

Qualifications

BS in Food Technology, University of British Columbia

MS in Microbiology, University of British Columbia

PhD in Biochemistry, University of Washington

Recent Publications

Probing the assembly of HDL mimetic, drug carrying nanoparticles using intrinsic fluorescences

Raut, S., Garud, A., Nagarajan, B., Sabnis, N., Remaley, A., Fudala, R., Gryczynski, I., Gryczynski, Z., Dzyuba, S. V., Borejdo, J. & Lacko, A., 1 Apr 2020, In: *Journal of Pharmacology and Experimental Therapeutics*. 373, 1, p. 113-121 9 p.

Lipoproteins and the Tumor Microenvironment

Dossou, A. S., Sabnis, N., Nagarajan, B., Mathew, E., Fudala, R. & Lacko, A. G., 2020, *Advances in Experimental Medicine and Biology*. Springer, p. 93-116 24 p. (Advances in Experimental Medicine and Biology; vol. 1272).

Identifying and targeting angiogenesis-related microRNAs in ovarian cancer

Chen, X., Mangala, L. S., Mooberry, L., Bayraktar, E., Dasari, S. K., Ma, S., Ivan, C., Court, K. A., Rodriguez-Aguayo, C., Bayraktar, R., Raut, S., Sabnis, N., Kong, X., Yang, X., Lopez-Berestein, G., Lacko, A. G. & Sood, A. K., 15 Aug 2019, In: *Oncogene*. 38, 33, p. 6095-6108 14 p.

[^{99m}Tc-HYNIC-N-dodecylamide]: a new hydrophobic tracer for labelling reconstituted high-density lipoproteins (rHDL) for radioimaging

Isaac-Olivé, K., Ocampo-García, B. E., Aranda-Lara, L., Santos-Cuevas, C. L., Jiménez-Mancilla, N. P., Luna-Gutiérrez, M. A., Medina, L. A., Nagarajan, B., Sabnis, N., Raut, S., Prokai, L. & Lacko, A. G., 14 Jan 2019, In: *Nanoscale*. 11, 2, p. 541-551 11 p.

The SR-B1 Receptor as a Potential Target for Treating Glioblastoma

Berney, E., Sabnis, N., Panchoo, M., Raut, S., Dickerman, R. & Lacko, A. G., 2019, In: *Journal of Oncology*. 2019, 1805841.

Reconstituted HDL: Drug delivery platform for overcoming biological barriers to cancer therapy

Raut, S., Mooberry, L., Sabnis, N., Garud, A., Dossou, A. S. & Lacko, A., 15 Oct 2018, In: *Frontiers in Pharmacology*. 9, OCT, 1154.

Scavenger receptor class B type 1 regulates neuroblastoma cell proliferation, migration and invasion

Panchoo, M. & Lacko, A., 1 Jan 2018, In: Biochemical and Biophysical Research Communications. 495, 1, p. 614-620 7 p.

Lipoproteins for therapeutic delivery: Recent advances and future opportunities

Raut, S., Dasseux, J. L., Sabnis, N. A., Mooberry, L. & Lacko, A., 2018, In: Therapeutic Delivery. 9, 4, p. 257-268 12 p.

Ultrasound-stimulated drug delivery of reconstituted high density lipoprotein nanoparticles: Effects of drug concentration on tumor uptake

Xiong, F., Xiong, M., Nirupama, S., Sirsi, S., Lacko, A. G. & Hoyt, K., 31 Oct 2017, *2017 IEEE International Ultrasonics Symposium, IUS 2017*. IEEE Computer Society, 8092380

Ultrasound-stimulated drug delivery of reconstituted high-density lipoprotein nanoparticles: Effects of drug concentration on tumor uptake

Xiong, F., Nirupama, S., Sirsi, S. R., Lacko, A. G. & Hoyt, K., 31 Oct 2017, *2017 IEEE International Ultrasonics Symposium, IUS 2017*. IEEE Computer Society, 8092663

Sponsored Projects

BIOMEDICAL RESEARCH SUPPORT GRANT

Lacko, A., Harris, B. G., Harris, B. G., GRACY, R. & AVADHANI, N.
National Center for Research Resources
31/12/89 → 29/09/94

Delivery of Nucleic Acids (mRNA) for Therapeutic Applications

Lacko, A.
Intramural Research(UNTHSC)
1/04/14 → 31/08/15

Delivery of Radioactive Imaging Agents by Reconstituted High Density Lipoproteins (rHDL). Validation of the rHDL/drug Delivery Model by Nuclear Molecular Imaging

Lacko, A.
Intramural Research(UNTHSC)
1/03/15 → 28/02/17

Enhanced Neuroblastoma Therapeutics Using Targeted Biocompatible Nanoparticles

Lacko, A. & Bowman, P.
Cook Children's Health Care System
1/01/13 → 31/08/16

MINORITY HIGH SCHOOL STUDENT RESEARCH APPERTICE PROGRAM

Lacko, A., GRACY, R., Harris, B. G., Harris, B. G., Harris, B. G., Harris, B. G. & TAYLOR, L.
National Center for Research Resources
31/12/89 → 28/02/95

NCI Contract Number HHSN261201200092C RE: rHDL nanoparticles; AG-13-1008

Lacko, A.
LipoMedics, Ltd. Co.
1/11/12 → 1/11/14

Novel Chemotherapy for High Risk Neuroblastoma

Bowman, P. & Lacko, A.
Intramural Research(UNTHSC)
15/01/10 → 14/01/11

Reconstituted High Density Lipoprotein Particles as siRNA Carriers

Lacko, A.
Fannin Partners, LLC
1/07/17 → 30/06/18

REVERSE CHOLESTEROL TRANSPORT

Lacko, A.
National Heart, Lung, and Blood Institute
1/01/93 → 31/12/93

Selective Tumor Delivery of Anti-Cancer Agents in Ovarian Cancer Therapy

Lacko, A.
Cancer Prevention & Res Inst of TX
1/12/14 → 30/05/18

STUDY OF AGE RELATED HYPERLIPIDEMIA IN RATS

Lacko, A.
National Institute on Aging
31/12/89 → 31/12/89

SUBSTRATE SPECIFICITY OF LCAT

Lacko, A.
National Heart, Lung, and Blood Institute
31/12/89 → 31/12/89

Targeting the Plasma High Density Lipoprotein Receptor (SR-B1) for Effective Anti-Cancer Therapeutics

Lacko, A.
LipoMedics, Ltd. Co.
1/03/16 → 1/03/17