# BIOGRAPHICAL SKETCH

NAME: SATCHI-FAINARO, RONIT

eRA COMMONS USER NAME (agency login): RONITSATCHI

POSITION TITLE: Head, Cancer Research and Nanomedicine Laboratory

EDUCATION/TRAINING

| INSTITUTION AND LOCATION | DEGREE (if applicable) | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| **The Hebrew University**, Faculty of Medicine, School of Pharmacy | B.Pharm. | 06/1995 | Pharmacology |
| **Internship in Industrial Pharmacy** in Perio Products LTD, Jerusalem, Israel | Internship Industrial Pharmacy | 03/1996 | Pharmaceutical Sciences |
| **University of London**, Faculty of Medicine, School of Pharmacy, Center for Polymer Therapeutics: Thesis title: "PDEPT: Polymer Directed Enzyme Prodrug Therapy". PI: Ruth Duncan, Ph.D. | Ph.D. (Direct path) | 11/1999 | Polymer chemistry, biochemistry and cancer nanomedicine |
| ***Tel Aviv University,*** *Faculty of Life Sciences,* Department of Cell research and Immunology, Israel. PI: Sara Lavi. | *Postdoctoral Research Fellow* | 06/2001 | Tumor biology, molecular biology, biochemistry and polymer therapeutics of proteins |
| **Harvard Medical School and Children's Hospital**, Boston, USA. PI: Judah Folkman | *Postdoctoral Research Fellow* | 09/2003 | Cancer and Vascular biology, Nanomedicine |

## A. PERSONAL STATEMENT

I am a Professor of Pharmacology in the Department of Physiology and Pharmacology at the Sackler Faculty of Medicine, Tel Aviv University. During my 13 years at Tel Aviv University, I gathered a multidisciplinary group of 30 outstanding scientists and collaborators in the pursuit of answering big questions such as: What triggers dormant cancers to switch to a fast-growing phenotype after long periods of time? What is the reason that some cancer cells choose one organ as opposed to another as a metastatic niche? Is there a certain sub-population of tumor cells within a tumor that holds a high angiogenic potential? Does it correlate with their ability to be "tumor initiating cells"?; and last but not least, based on the answers to these questions, can highly-selective drugs be designed to eradicate this sub-population of cells and by that- eliminate the tumors, fulfilling the "Magic Bullet" dream envisioned by Paul Ehrlich more than 100 years ago? To this end, we identified molecular signatures that predict tumor dormancy associated with incompetency to recruit the supporting stromal microenvironment and the factors determining long-term survivorship of cancer patients. Based on these signatures, my lab was the first to rationally-design multi-modality targeted polymer therapeutics combining synergistically anti-stromal agents with chemotherapeutics and RNAi that offer the potential for improved efficacy and diminished toxicity in the treatment of cancer.

My research focuses on tumor biology, cancer dormancy, tumor-host interactions, angiogenesis, molecular and non-invasive intravital imaging of animal models of cancer, 3D-printed cancer models and personalized nanomedicines for cancer theranostics (***thera***py and diagn***ostics***). Throughout, I have maintained an interest in understanding the biological rationale for the design of nanomedicines suitable for transfer into clinical testing. My multidisciplinary research laboratory focuses on basic research elucidating the mechanisms underlying the switch from dormancy leading to the discovery of new molecular targets interrupting tumor-host interactions. My laboratory has long-standing interest in polymer-based systems for drug delivery of small molecules, oligonucleotides and peptides for the treatment of cancer, and other angiogenesis-dependent diseases. Our approach is followed by the design of highly-selective targeting molecules integrating biology, chemistry, protein engineering, molecular imaging, computational approaches, material sciences and nanotechnology to selectively guide drugs and biological entities into pathological sites.

I have experience in leading multi-investigators and multi-institutional projects. I have organized several international symposiums including the Gordon Research Conference on Cancer Nanomedicine.

## B. POSITIONS AND HONORS

### Positions and Employment

**2019-present** ***Member, The Rothschild Fellowships Committee***
**2019-present** ***Member, Board* of Governors,** Tel Aviv University.
**2019-present** ***Member, Science Oriented Youth Committee,*** Tel Aviv University.
**2018-present** ***Director, Board of Directors,*** Teva Pharmaceutical Industries Ltd.
**2018-present** ***Member, Scientific Advisory Board,*** Hospital Universitari Vall d'Hebron - Institut de Recerca (VHIR), Barcelona, Spain.
**2018-present** ***Member, Scientific Advisory Board*,** Israel Cancer Association.
**2018-present** ***Member, Scientific Advisory Board*,** VC VLX.
**2017-present** **Member, Advisory Board,** MIT Enterprise Forum of Israel**.**
**2017-present** **Kurt and Herman Lion Chair in Nanosciences and Nanotechnologies**
**2016-present** ***Director,* TAU Kahn 3D-BioPrinting Initiative**
**2015-present** ***Full Professor***, Department of Physiology and Pharmacology, Sackler School of Medicine, Tel Aviv University, Israel.
**2015-present** ***Member, Preclinical Dean Committee,*** Sackler Faculty of Medicine, TAU, Israel.
**2014-present** ***Member, Scientific Advisory Board*,** Blavatnik Center for Drug Discovery.
**2014-2018** ***Chair,*** Dept. of Physiology and Pharmacology, Sackler School of Medicine, TAU, Israel.
**2010-2016** **Chair,** Tel Aviv University Institutional Animal Care and Use Committee (IACUC).
**2011-2014** ***Associate Professor***, Dept. Physiology and Pharmacology, Sackler School of Medicine, TAU.
**2006-2010** ***Assistant Professor*,** Dept. Physiology and Pharmacology, Sackler School of Medicine, TAU.
**2006-present** **Principal Investigator, Head,** Cancer Research and Nanomedicine Laboratory; http://SatchiFainaroLab.com
**2005- 2010** ***Visiting Associate Professor***, Harvard Medical School and Children's Hospital Boston, USA.
**2002-2005** ***Instructor in Surgery***, Harvard Medical School, Boston, USA.
**2002-2005** ***Research Associate*,** Children's Hospital, Boston, USA.
**1999-present** ***Consultant*,** Several Biotech, Devices and Pharmaceutical Companies, VCs.

### Other Experience and Professional Memberships

**2010- present** ***Member,*** The Israel Society for Cancer Research (ISCR).
**2000- present** **Member,** The Israel Society for Microbiology (ISM).
**1997- present** **Active member**, The American Association for Cancer Research (AACR).
**1996- present** ***Member,*** The Controlled Release Society (CRS). **PRESIDENT** of the Israeli CRS 2010-2016.
**1996- present** ***Member,*** The European Association of Cancer Research (EACR).
**1996- present** ***Member,*** The British Association for Cancer Research (BACR).
**1996- present** ***Member,*** The British Pharmaceutical Sciences Group.
**1995- present** ***Member,*** The Pharmaceutical Association of Israel.
**1995- present** ***Member,*** The Israel Society of Clinical Pharmacy and Biopharmaceutics.

### Member of Editorial Board/ Reviewer

**EDITORIAL BOARDS:**
Nanomedicine: Nanotechnology, Biology, and Medicine (IF=6.155), Advances in Polymer Science (Guest Editor, IF=7.09), Advanced Drug Delivery Reviews (IF=13.96), Clinical Cancer Drugs (Editor-in-chief, new), Molecular Pharmaceutics (Guest editor, IF=4.782), Israel Journal of Chemistry (Guest Editor).

### Selected Awards and Honors

**1996-** British Council Chevening Award; **1997**-The Nagai Foundation Tokyo Graduate Student Award; **1997**-The Overseas Research Student (ORS) Award; **1998-** The Wingate Scholarship; **1999**- CRS-3M Graduate Student Outstanding Research Award in Drug Delivery; **1999-** Vectura Ltd. Postdoctoral Grant; **2000-** The A.M. Cook Prize for Ph.D. Thesis; **2000-** The Becton Dickinson Award; **2001**-UICC Award; **2001-** Fulbright scholarship; **2001-** Rothschild scholarship; **2003**- CRS-Ethypharm Outstanding Pharmaceutical Paper Award; **2005-** EACR Young Cancer Researcher highly commended Award; **2006-** Alon Fellowship for outstanding young investigators; **2007**- Marguerite Stolz Research Fellowship Fund for Outstanding Junior Faculty / Gutwirth Award; **2008-** Scientific achievements were acknowledged by inclusion in the 40 under 40 list of the The Marker journal, Israel; **2008-** Scientific achievements were acknowledged by inclusion in the "50 Most promising women" list of the Calcalist journal, Israel; **2009-** The JULUDAN Prize for the Advancement of Technology in Medicine; **2010-**

Elected for **PRESIDENT** of the Israel Chapter of the Controlled Release Society; **2011,2013-** Scientific achievements were acknowledged by inclusion in the "50 Most influential women" list of the Globes journal, Israel; **2012, 2014, 2018-** Excellence in Teaching Award, Tel Aviv University; **2012-** Person of the year in the field of Medicine, Forbes, Israel; **2013**- Teva Pharmaceutical Industries Founders Award for the Discovery of new molecular mechanisms and targets that would lead to new therapeutic approaches; **2014**- European Research Council (ERC) Consolidator Award**; 2014-** Saban Family Foundation MRA Team Science Award**; 2014-** Scientific achievements were acknowledged by inclusion in the "50 Most powerful and influential women" list of the Forbes journal, Israel (#13/50); **2016-** "Women at the front" Saloona Prize List in the category of Science and Medicine. **2016-** Represented Israel together with 6 Scientist-Architect teams at the 2016 **Biennale in Venice**, Italy, on the Inspiration of Biology and Medicine on Architecture; **2017, 2018-** Research prizes for exceptional publications, Tel Aviv University; **2018-** Israel Cancer Research (ICRF) Professorship; **2019-** European Research Council (ERC) Advanced Grant**; 2019-** ERC Proof of Concept (PoC) grant**. 2019-** Melanoma Research Alliance (MRA) Grant**. 2019**-Women of the Year, Globes, Israel**. 2019-** The Youdim Family Prize for Excellence in Cancer Research. **2019**- Humboldt Foundation Bessel Research Prize.

**C. CONTRIBUTION TO SCIENCE**

**1. Development of the first selective polymeric nanomedicines bearing angiogenesis inhibitors and the first multi-modality targeted polymer therapeutics combining anti-angiogenic agents with chemotherapeutics.** During my postdoctoral fellowship in the laboratory of the late Judah Folkman, I combined emerging technologies to tackle an unsolved problem of selective targeting of anti-angiogenic drugs to tumor blood vessels. I designed, synthesized and characterized a water-soluble conjugate of N-(2-hydroxypropyl) methacrylamide (HPMA) copolymer, cathepsin-cleavable linker and TNP-470, a very potent agent but highly toxic in clinical trials. This conjugate accumulated selectively in tumor vessels due to the enhanced permeability and retention (EPR) effect. It substantially enhanced and prolonged the anticancer activity of TNP-470. Polymer conjugation prevented TNP-470 from crossing the blood-brain barrier and decreased its accumulation in normal organs, thereby avoiding drug-related toxicities. This new approach for targeting angiogenesis inhibitors specifically to the tumor vasculature provided a new strategy for the rational design of cancer therapies. This work was published in *Nature Medicine* in 2004. This is the first anti-angiogenic nanomedicine. Prior to this work, polymer therapeutics were targeted to cancer cells whereas the stromal compartment was neglected. Several patents were filed on this anti-angiogenic nanomedicine and it was licensed to a pharmaceutical company.

A second project investigated during my postdoctoral fellowship focused on the hyperpermeability associated with angiogenic blood vessels compared to that of normal vessels. I found that several anti-angiogenic agents decrease vascular hyperpermeability of tumor blood vessels, reduce delayed-type hypersensitivity, and pulmonary edema induced by IL-2. I found that the mechanism was via inhibition of VEGF-induced phosphorylation of VEGFR-2, calcium influx, and RhoA activation in endothelial cells. These findings were published in *Cancer Cell* in 2005. This was the first time to identify the inhibition of VEGF-induced vessel hyperpermeability as the mechanism of action of many angiogenesis inhibitors. It suggests that this activity likely contributes to their anti-angiogenic effect, thus they can be used in the treatment of cancer, inflammation and other angiogenesis-dependent diseases. The understanding that targeting only a single cellular compartment is not sufficient to foster a significant antitumor response, motivated my laboratory to focus on the development of combination nanomedicines targeting tumor and host compartments synergistically. This new treatment modality has demonstrated great promise in multiple tumor types, with enhanced antitumor activity and reduced toxicity.

a. **Satchi-Fainaro R**, *et al.* (Folkman J), Targeting angiogenesis with a conjugate of HPMA copolymer and TNP-470, *Nature Medicine*, 10(3), 255-261 (2004).
b. **Satchi-Fainaro R**, *et al.* (Folkman J), Inhibition of vessel permeability by TNP-470 and its polymer conjugate, caplostatin, *Cancer Cell*, 7(3), 251-261 (2005). **(Cover).**
c. Miller K, *et al.* (**Satchi-Fainaro R)**, Targeting bone metastases with bi-specific anticancer and anti-angiogenic polymer-alendronate-taxane conjugate, *Angewandte Chemie-International Edition English* 48(16) 2949–2954 (2009).
d. Markovsky E, Baabur-Cohen H, **Satchi-Fainaro R,** Anticancer polymeric nanomedicine bearing synergistic drug combination is superior to a mixture of individually-conjugated drugs**,** *Journal of Controlled Release*, 187: 145–157 (2014). **(Cover).**

**2. Development of a library of polymeric nanocarriers for the selective delivery of oligonucleotides to tumors.** We published a successful novel approach using biocompatible polyglycerol dendrimers (with Rainer Haag's group) and polyaminated polyglutamic acid for parenteral delivery of siRNA and microRNA to tumors eliminating the need to know the tumor location. Ongoing experiments show that, using this unique platform technology as a RNAi nanocarrier, we were able to suppress brain tumor growth and significantly increase the

time to progression and survival of orthotopic glioblastoma-bearing mice. This unprecedented inhibition of high-grade glioblastoma by targeting its downstream effectors and inhibiting cells proliferation and migration, suggests a key role for these anticancer miRNAs in gliomas. Our results also suggest that this anticancer polyplex could serve as a potential therapeutic agent for untreatable and temozolomide-resistant brain tumors. Efforts were also focused on using the polyaminated polyglutamic acid polymeric nanocarriers for the delivery of several siRNAs/microRNAs for ovarian carcinoma, breast cancer adenocarcinoma and osteosarcoma. These projects were a part of a Magneton collaboration with Rosetta Genomics (polyglycerol) and of MAGNET Rimonim Consortium with QBI and Rosetta Genomics (polyglutamic acid).

a. Ofek P, Fischer W, Calderón M, Haag R and **Satchi-Fainaro R**, *In vivo* delivery of small interfering RNA to tumors and their vasculature by novel dendritic nanocarriers, *FASEB Journal*, 24(9), 3122-3134 (2010).
b. Shatsberg Z, *et al.,* (**Satchi-Fainaro R),** Functionalized nanogels carrying an anticancer microRNA for glioblastoma therapy, *Journal of Controlled Release*, 239:159-68 (2016).
c. Polyak D*, Krivitsky A*, Scomparin A*, *et al.,* (**Satchi-Fainaro R),** Systemic delivery of siRNA by aminated poly(α)glutamate for the treatment of solid tumors, *Journal of Controlled Release*, 257:132-143 (2017).
d. Krivitsky A*, Polyak D*, Scomparin A*, *et al.,* (**Satchi-Fainaro R)**, Amphiphilic poly(α)glutamate polymeric micelles for systemic administration of siRNA to tumors. *Nanomedicine* 14(2):303-315, (2017).

**3. Identification of the molecular and cellular changes in tumor-associated host-stromal interactions that govern tumor dormancy**. Although dormant tumors are highly prevalent within the human population, the underlying mechanisms are still mostly unknown. We set to shed light on the mechanism underlying the tumor dormancy fundamental cancer biology phenomenon. A better molecular understanding of tumor dormancy and the availability of dormancy markers and therapeutic targets will most likely change our perception of tumor progression and, consequently, the way we diagnose and treat the disease. Our findings have led to the discovery of novel tumor dormancy-associated markers and targets and to the development of dormancy-promoting nano-therapies. This project is the basis for an ERC consolidator award granted to me in 2014-2019, a recent ERC Advanced award and an ISF grant for which I received the Teva Pharmaceutical Industries Founders Award for “the Discovery of new molecular mechanisms and targets that would lead to new therapeutic approaches”. A similar approach was taken while investigating the mechanisms responsible for long-term survivors *versus* short-term survivors of pancreatic cancer (PDAC) patients.

a. Tiram G, *et al.,* (**Satchi-Fainaro R)** Identification of Dormancy-Associated MicroRNAs for the Design of Osteosarcoma-Targeted Dendritic Polyglycerol Nanopolyplexes, *ACS Nano 10(2): 2028-2045* (2016).
b. Ferber S*, Tiram G*, *et al.,* (**Satchi-Fainaro R)**, Co-targeting the tumor endothelium and P-selectin-expressing glioblastoma cells leads to a remarkable therapeutic outcome. *eLife,* 6 pii: e25281(2017).
c. Tiram G*, Ferber S*, *et al.*, (**Satchi-Fainaro R)**, Reverting the molecular fingerprint of tumor dormancy as a therapeutic strategy for glioblastoma, *FASEB J*, 32 (11), 5835-5850 (2018).
d. Gibori H, *et al.*, (**Satchi-Fainaro R),** Amphiphilic nanocarrier-induced modulation of PLK1 and miR-34a leads to improved therapeutic response in pancreatic cancer**,** *Nature Communications,* Jan 2;9(1):16 (2018).

**4. Development of diagnostic and theranostic nanomaterials for cancer.** We developed a novel kind of Turn-ON probes with Near-Infrared (NIR) fluorescence mode of action. These probes were designed to fluorescently-report in real-time the presence of a certain analyte or an enzyme at a pathological site using intravital non-invasive imaging. We conjugated these probes to a drug-bearing polymer, and while they are Turned-OFF in the bloodstream following intravenous injection, they Turn-ON fluorescently at a near infrared wavelength when arriving to the tumor and releasing the drugs reporting on the (i) location of the tumor (used for diagnosis and for image-guided surgery) and (ii) drug release and activation, hence their definition as theranostic nanomedicines (therapy and diagnostics of cancer). In collaboration with the lab of Doron Shabat, a similar approach was taken for the design of chemiluminescence Turn-ON probes. This technology was licensed to Biosynth.

a. Redy-Keisar O, Kisin-Finfer E, Ferber S, **Satchi-Fainaro R*,** and Shabat D*, Synthesis and Use of QCy7-derived Modular Probes for Detection and Imaging of Biologically Relevant Analytes, *Nature Protocols*, 9(1), 27-36 (2014). ***Corresponding authors**.
b. Ferber S, *et al.,* (**Satchi-Fainaro R)**, Polymeric nanotheranostics for real-time non-invasive optical imaging of breast cancer progression and drug release, *Cancer Letters*, 352(1):81-89 (2014).
c. Blau R, *et al.,* (**Satchi-Fainaro R),** Image-Guided Surgery Using Near-Infrared Turn-ON Fluorescent Nanoprobes for Precise Detection of Tumor Margins, *Theranostics*, 24;8(13):3437-3460 (2018). **(Cover).**
d. Hananya N, Green O, Blau R, **Satchi-Fainaro R***, Shabat D*, A Highly-Efficient Chemiluminescence Probe for Detection of Singlet Oxygen in Living Cells. *Angewandte Chemie Int Ed Engl.* 138(40):13438-13446 (2017) ***Corresponding authors.**

**5. Rational-design of novel nano-sized delivery systems for immunotherapies.**
Our research is currently focused on the pharmacological aspects of a multidisciplinary project within the frontier of cancer immunotherapy where nanotechnology, immunology, chemical biology, biotechnology and animal modeling will provide the rationale for novel anticancer treatments. This approach is based on the design of precision nanomedicines that will interfere within tumor-host interactions and stimulate the immune system to attack the tumor cells. We are synthesizing PLGA-based nanovaccines targeting the dendritic cells to activate T cells against primary and secondary brain neoplasms such as glioblastoma, melanoma brain metastases and breast cancer brain metastases. Another immunotherapy approach tagging heteroaryl chemotherapeutic drug molecules with a ketone functional group and employing it for Antibody-Drug Conjugates (ADC) applications was recently published. This project is the basis for an ERC Advanced grant awarded to me in 2019-2024. Based on this project, we signed a contract with Merck Global Healthcare in collaboration with Prof. Doron Shabat.

a. Conniot J*, Scomparin A*, *et al. (***Satchi-Fainaro R***, Florindo H*), Immunization with mannosylated nanovaccines and inhibition of the immune-suppressing microenvironment sensitizes melanoma to immune checkpoint modulators, *Nature Nanotechnology, 14(9):891-901* (2019) ***Corresponding authors**.
b. Gnaim S, *et al.* (**Satchi-Fainaro R***, Shabat D*), Tagging the Untaggable: A Difluoroalkyl-Sulfinate Ketone-Based Reagent for Direct C-H Functionalization of Bioactive Heteroarenes, *Bioconjugate Chemistry*, 27(9):1965-71 (2016). ***Corresponding authors.**
c. Zafir-Lavie I, *et al.* (**Satchi-Fainaro R)**, Successful gene therapy obtained by fibroblasts expressing anti-HER2 antibody for HER2-positive breast cancer brain metastases, *Journal of Controlled Release, 291:80-89* (2018).

**D. CURRENT RESEARCH SUPPORT**

**2018-2023 Israel Science Foundation (ISF) grant, #1969/18 (Satchi-Fainaro, PI, 8%):** Elucidating tumor-host interactions to design precision nanomedicines for the prevention and treatment of melanoma.

**2017-2020 European Innovative Research & Technological Development Projects in Nanomedicine, framework of the ERA-NET EuroNanoMed-II: MultiNano@MBM #3-13620 (Satchi-Fainaro, PI, 5%; Co-PIs: Florindo, Jung, Recio).** Modulation of melanoma-stroma interactions using a rationally-designed nanomedicine combining BRAFi-, MEKi- and immunotherapies.

**2016-2021 Morris Kahn Foundation (Satchi-Fainaro, PI, 10%):** 3D-bioprinted cancer modeling.

**2017-2020 Merck Global Healthcare (PIs: Satchi-Fainaro-5%, and Shabat):** A novel approach for Antibody-drug conjugates design.

**2018-2021 MSCA-ITN-2017: Innovative Training Networks (Satchi-Fainaro, Co-PI, 3%):** Bio-orthogonal catalysis for cancer therapy (THERACAT).

**2018-2025 Israel Cancer Research Foundation (ICRF) Professorship (Satchi-Fainaro, PI, 5%):** P-selectin–targeted nanomedicines and immunotherapy for brain metastases prevention.

**2019-2024 European Research Council (ERC) Advanced Grant # 835227 3DBrainStrom (Satchi-Fainaro, PI, 50%):** Brain metastases: Deciphering tumor-stroma interactions in three dimensions for the rational design of nanomedicines.

**2019-2022 Melanoma Research Alliance (MRA) Grant (Satchi-Fainaro, PI, 7%):** Nanomedicine targeting melanoma-astrocytes interplay in 3D brain metastases.
**2019-2020 European Research Council (ERC) Proof of Concept (PoC) # 862580 3DCanPredict (Satchi-Fainaro, PI, 5%):** Predicting clinical response to anticancer drugs using 3D-bioprinted tumor models for personalized therapy.
**2019-2022 La Caixa Banking Foundation Health Research (#HR18-00589) (Satchi-Fainaro Co-PI, 5%, and Co-PIs: Vicent and Florindo):** Sensitizing pancreatic cancer to immunotherapy with multimodal precision nanomedicines.
**2019-2020 Teva Pharmaceutical Industries (Satchi-Fainaro, PI, 2%):** Evaluation of immunotherapies in 3D tumor models.

**E. SCIENTIFIC PUBLICATIONS** https://www.ncbi.nlm.nih.gov/pubmed/?term=satchi-fainaro
https://www.ncbi.nlm.nih.gov/pubmed/?term=satchi+r++duncan
**Additional information:** Published over 110 manuscripts, edited 2 books, 12 book chapters, over 6000 citations, over 400 abstracts and oral presentations, h-index 40, 51 patents applications/granted worldwide.

## ORIGINAL ARTICLES

1. **Satchi R**, Connors TA, Duncan R, PDEPT: Polymer-directed enzyme prodrug therapy. 1. HPMA copolymer-cathepsin B and PK1 as a model combination, *British Journal of Cancer,* **85(7),** 1070-1076 (2001).
2. **Satchi-Fainaro R**, Wrasidlo W, Lode HN, Shabat D, Synthesis and characterization of a catalytic antibody–HPMA copolymer conjugate as a tool for tumor selective prodrug activation**,** *Bioorganic & Medicinal Chemistry,* **10 (9)**, 3023-3029 (2002).
3. **Satchi-Fainaro R**, Hailu H, Davies JW, Summerford C, Duncan R, PDEPT: Polymer directed enzyme prodrug therapy. 2. HPMA copolymer-β-lactamase and HPMA copolymer-cephalosporin-doxorubicin as a model combination, *Bioconjugate Chemistry*, **14(4)**, 797-804 (2003).
4. Périno S, Contino-Pépin C, **Satchi-Fainaro R**, Butterfield C, Pucci B, Inhibition of angiogenesis by THAM-derived cotelomers endowed with thalidomide moieties, *Bioorganic and Medicinal Chemistry Letters*, **14(2)**, 421-425 (2004).
5. **Satchi-Fainaro R**, Puder M, Davies J, Tran H, Sampson DA, Greene AK, Corfas G, Folkman J, Targeting angiogenesis with a conjugate of HPMA copolymer and TNP-470, *Nature Medicine*, **10(3)**, 255-261 (2004). **(Commentaries in:** Hutchinson E. Angiogenesis: A helping hand, *Nature Reviews Cancer* 4: 248-249, 2004; Ahmad K. Modified angiogenesis inhibitor for selective targeting of tumors; *The Lancet Oncology* 5: 265, 2004; Polymer-angiogenesis inhibitor combination may be less toxic, *JNCI* March 3, 2004; and Acosta F, Parsa AT, More effective targeting of tumor angiogenesis, *Neurosurgery*, 54 (5): N8-N8 May 2004; *Harvard University gazette*, February 26, 2004, Cancer drug given new life, Its toxic side effects eliminated, Cromie WJ; Focus, McCaffrey P, March 19, 2004 Angiogenesis Inhibitors Revived, Revealed in Progress Against Cancer).
6. **Satchi-Fainaro R**, Mamluk R, Wang L, Short SM, Nagy JA, Feng D, Dvorak AM, Dvorak HF, Puder M, Mukhopadhyay D, Folkman J, Inhibition of vessel permeability by TNP-470 and its polymer conjugate, caplostatin, *Cancer Cell*, **7(3)**, 251-261 (2005). **(**Commentaries in: Viinikka T, Leak-patching protein shuts down tumor growth, swelling, *Focus*, March 25, 2005**).**
7. Tjin Tham Sjin RM, **Satchi-Fainaro R**, Birsner AE, Ramanujam VM, Folkman J, Javaherian K, A 27 amino acid synthetic peptide corresponding to the $NH_2$-terminal zinc binding domain of endostatin is responsible for its antitumor activity, *Cancer Research*, **65(9),** 3656-3663 (2005).
8. Javid PJ, Greene AK, Garza J, Gura K, Alwayn IAP, Voss S, Nose V, **Satchi-Fainaro R**, Zauche B, Mulkern RV, Jaksic T, Bistrian B, Folkman J, Puder M, The route of lipid administration affects parenteral nutrition–induced hepatic steatosis in a mouse model**,** *Journal of Pediatric Surgery*, **40(9),** 1446-1453 (2005).
9. Becker CM, Wright RD, **Satchi-Fainaro R**, Funakoshi T, Folkman J, Kung AL, D'Amato RJ, A novel non-invasive model of endometriosis for monitoring the efficacy of antiangiogenic therapy, *American Journal of Pathology*, **168(6)** 2074-2084 (2006).
10. Nahari D, **Satchi-Fainaro R**, Chen M, Mitchell I, Task LB, Liu Z, Kihneman J, Carroll AB, Terada LS, Nwariaku F, Tumor Cytotoxicity and Endothelial Rac Inhibition Induced by TNP-470 in Anaplastic Thyroid Cancer, *Molecular Cancer Therapeutics,* **6(4)**, 1329-1337 (2007).
11. Sagi A, Segal E, **Satchi-Fainaro R***, Shabat D*, Remarkable drug-release enhancement with an elimination-based $AB_3$ self-immolative dendritic amplifier, *Bioorganic and Medicinal Chemistry*, **15(11)**, 3720–3727 (2007). ***Corresponding authors.**
12. Chesler L, Goldenberg DD, Seales IT, **Satchi-Fainaro R**, Grimmer M, Collins R, Struett C, Nguyen KN, Kim G, Tihan T, Bao Y, Brekken RA, Bergers G, Folkman J, Weiss WA**,** Malignant progression and blockade of angiogenesis in a murine transgenic model of neuroblastoma**,** *Cancer Research*, **67(19)**, 9435-9442 (2007).
13. Ryppa C, Mann-Steinberg H, Fichtner I, Weber H, **Satchi-Fainaro R**, Biniossek M, Kratz F, *In vitro* and *in vivo* evaluation of doxorubicin conjugates with the divalent peptide E-[c(RGDfK)$_2$] that target integrin $\alpha_v\beta_3$, *Bioconjugate Chemistry,* **19(7)**, 1414-1422. (2008).
14. Ryppa C, Mann-Steinberg H, Biniossek M, **Satchi-Fainaro R***, Kratz F*, *In vitro* and *in vivo* evaluation of a paclitaxel conjugate with the divalent peptide E-[c(RGDfK)$_2$] that targets integrin $\alpha_v\beta_3$, *International Journal of Pharmaceutics,* **368(1-2)**, 89-97 (2009). ***Corresponding authors.**

15. Stern L, Perry R, Ofek P, Many A, Shabat D, **Satchi-Fainaro R**, A novel antitumor prodrug platform designed to be cleaved by the endopeptidase legumain, *Bioconjugate Chemistry*, ***20(3)***, 500–510 (2009).
16. Miller K, Erez R, Segal E, Shabat D, **Satchi-Fainaro R**, Targeting bone metastases with bi-specific anticancer and anti-angiogenic polymer-alendronate-taxane conjugate, *Angewandte Chemie-International Edition English* **48(16)**, 2949 –2954 (2009).
17. Segal E, Pan HZ, Ofek P, Udagawa T, Kopeckova P, Kopecek J, **Satchi-Fainaro R**, Targeting angiogenesis-dependent calcified neoplasms using combined polymer therapeutics, *PLoS ONE*, **4(4):**e5233 (2009).
18. Erez R, Segal E, Miller K, **Satchi-Fainaro R**, Shabat D, Enhanced cytotoxicity of a polymer-drug conjugate with triple payload of paclitaxel, *Bioorganic and Medicinal Chemistry,* **17(13)**, 4327–4335 (2009).
19. Weinstain R*, Segal E*, **Satchi-Fainaro R**, Shabat D, Real-time monitoring of drug release, *Chemical Communications (Camb)* 46(4), 553-555 (2010).
20. Ofek P, Fischer W, Calderón M, Haag R, **Satchi-Fainaro R**, In vivo delivery of small interfering RNA to tumors and their vasculature by novel dendritic nanocarriers, *FASEB Journal*, 24(9), 3122-3134 (2010).
21. Marom H, Miller K, Bechor-Bar Y, Tsarfaty G, **Satchi-Fainaro R***, Gozin M*, Toward development of targeted nonsteroidal antiandrogen-1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetic acid-gadolinium complex for prostate cancer diagnostics, *Journal of Medicinal Chemistry*, 53(17), 6316-6325 (2010). ***Corresponding authors.**
22. Polyak D, Ryppa C, Ofek P, Licha K, Many A, Kratz F, **Satchi-Fainaro R**, Development of PEGylated doxorubicin-E-[c(RGDfK)$_2$] conjugate for integrin-targeted cancer therapy, *Polymers for Advanced Technology*, 22, 103–113 (2011).
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