

# ALEXANDER A. SHER

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Result-driven scientist with innovative thinking and substantial expertise in research and development in the area of food and beverages, and with broad experience in teaching Inorganic, Physical, Colloidal and Food Chemistry. Instrumental in developing novel solutions in areas of dispersions generation and stability, hydrocolloids, texture improvement, mineral fortification, water treatment and dispensing systems, as well as in industrialization of the developed proprietary food and beverages. Led the Nestlé R&D Expert Network in area of Beverages and Systems. Holds 99 granted and pending patents and has authored over 80 scientific publications.

## SKILLS

- Effective combination of research and academic skills, substantial achievements in product/process development and industrialization of the new beverages and food products.
- Deep knowledge in characterization, generation and stabilization of emulsions, foams and suspensions and physico-chemical properties of surface-active agents, emulsifiers, hydrocolloids, proteins, and microelements.
- Thorough understanding of the interaction between various ingredients/process parameters and their impact on product properties.
- Significant experience in product/process development. The expertise was successfully applied for developing and scaling-up novel formulations/technologies from bench to pilot plant and factory.
- Excellent management skills with proven ability to drive multi-disciplinary teams to deliver project objectives on time and target.
- Team player with strong communication and analytical skills.
- Proactive in learning and disseminating new scientific ideas and technological approaches.

## POSITIONS HELD

- **University of Massachusetts Amherst, USA**
  - Adjunct Professor, 2018-present
- **Nestlé Product Development Center, Marysville, OH, USA**
  - Senior Expert Scientist, 2017-2018
  - Expert Scientist, Dispersion Technology Platform Leader, 2008-2016
  - Beverages & Systems Expert Network Leader, 2005-2014
  - Senior Research Scientist, 2005-2008
- **Nestlé Research Center, New Milford, CT, USA**
  - Senior Research Scientist, 2000-2004
  - Research Scientist, 1997-1999
- **Moscow State University of Food Production, Dept. of General & Inorganic Chemistry, Russia**
  - From Assistant Professor to Full Professor and Head of Department, 1980 - 1996

## ADDITIONAL RELEVANT EXPERIENCE

- **Cornell University, Dept. of Food Science NY, USA** - Visiting Scientist
- **Agriculture Research Center, USDA, Beltsville, USA** - Visiting Scientist
- **University of Hohenheim, Stuttgart, Germany** - Visiting Professor
- **University of Ljubljana, Slovenia** - Visiting Scientist

## MAIN PROFESSIONAL ACHIEVEMENTS

- **Emulsions: Characterization, Generation and Stability**
  - Created COFFEE-MATE liquid creamers using unique emulsifier/hydrocolloid stabilizing systems, enabling successful product launches.
  - Developed dairy and plant based NATURAL BLISS liquid creamers resulted in creating of new multi-million business.
- **Foams: Characterization, Generation and Stability**
  - Invented unique and innovative aerated aseptic coffee beverages breaking the current category codes. The beverages were launched in China (2016) and USA (January 2019).
  - Developed coffee extract with improved foaming properties. The product was successfully launched in Europe (France, Germany, etc).
  - Created novel cappuccino and espresso type ready-to-drink (RTD) beverages which were successfully launched in Europe and Asia.
- **Hydrocolloids. Suspensions Stability. Sugar/fat reduction**
  - Created novel aseptic RTD dairy and coffee beverages using unique hydrocolloid texturizing/stabilizing systems to overcome product instability issues and improve beverage texture/mouthfeel. The innovative solutions enabled successful launches of the proprietary reduced fat/sugar RTD NESQUIK in USA, RTD NESCAU and ALPINO in Brazil, MILO in Asia.
- **Controlled protein aggregation**
  - Developed controlled protein aggregation solutions for texture/mouthfeel enhancement of RTD Cocoa Malt and RTD Coffee beverages. The concept was applied for clean label solutions, allowing improvement beverage texture/mouthfeel while removing hydrocolloids.
- **Clean label**
  - Developed novel clean label solutions for transversal applications in cross-product categories such as RTD flavored milk, RTD Coffee and RTD nutritional beverages.
  - Invented clean label RTD peanut milk with improved texture and stability for multi-million business. The product was ranked top 1 in the Consumer Preference Test in China.
- **Water treatment**
  - Developed and commercialized unique Nestlé water treatment cartridges that significantly reduces scale build-up in water heating systems. These cartridges were used in Nestlé dispensing machines, e.g. in ALLORA dispensers (UK and France) and Nespresso machines.
- **Mineral Fortification**
  - *Iron fortification*: developed proprietary solutions to deliver bioavailable iron without affecting organoleptic properties of food and beverages, particularly those containing polyphenols (e.g., cocoa, coffee), lipids (e.g., milk fat, fish oil) and/or vitamins (ascorbic acid).
  - *Calcium/magnesium fortification*: created proprietary solutions for sensitive liquid products, particularly for dairy and nutritional beverages.
- **Microelements**
  - Created new technologies to control antibiotic biosynthesis based on kinetics of microelement complex formation during microorganism growth. The technologies were commercialized in antibiotic factories.
  - Invented novel solutions based on metal ions – bio-ligand (proteins, amino acids) interactions which were commercialized for demetallization of food liquids.
  - Developed novel spectroscopic and electrochemical methods for determination of microelements (As, Pb, Cu, Zn, etc.) in food and beverages.
- **Dispersion Technology Platform**
  - Led Platform. Aligned platform roadmaps with business strategy/pipelines and established platform objectives. Identified key focus areas and priorities. Leveraged Science and Technology into proven solutions.

- **Beverage Dispensing Systems**

- Led Nestlé Beverages & Systems Expert network. Developed strategies that influenced business decisions. Enabled successful launches of breakthrough product/process innovations through successful completion of R&D projects guided and supported by the network.
- Led Nestlé Portion Delivery Systems Core Technology. Prepared technology strategy, identified opportunities for new technologies to drive competitive advantages. Organized numerous workshops, leveraged and disseminated knowledge within R&D community.
- Invented numerous innovative whipper and whipper-less solutions which were implemented in dispensing machines in USA and Europe providing high quality foamed and non-foamed beverages.
- Developed proprietary shelf stable liquid concentrates to control ice crystal sizes and improve mouthfeel of the granita slushes which were launched in North America and UK markets.

- **External collaboration**

- Created Research Agreements with universities (University of Massachusetts, Purdue University, USA; Reading University, UK). Disseminated and leveraged external state-of-the-art development in science and technology.
- Established Research Agreements with key suppliers to accelerate innovations.

## **EDUCATION**

- D.Sc. (Bio-inorganic Chemistry), Moscow State University of Food Production, Russia.
- Ph.D. (Bio-inorganic/Analytical Chemistry), University of Ljubljana, Slovenia.
- Ph.D. (Inorganic and Physical Chemistry), Lomonosov Moscow State University, Russia.
- M.Sc. (Chemistry), *summa cum laude*, Lomonosov Moscow State University, Moscow, Russia.
- Expert-auditor Diploma (Quality Assurance of Foodstuff). Moscow State Institute of Metrology, Standardization and Certification, Moscow, Russia.

## **PATENTS / PUBLICATIONS**

- 152 invention disclosures, 99 granted/pending patents (#15 in the list of worldwide top inventors for the class "Food or edible material: processes, compositions and products").
- Over 80 publications.
- 9 Russian State Food Safety Standards related to heavy metal determination in foodstuff.

## **MAIN AWARDS**

Recognized for superior contribution, including:

- Nestlé CTO 150th Anniversary Award (2016)
- R&D China Invention Award (2016)
- Finalist of 2014 Nestlé Patent Award
- Winner of 2013 Nestlé Patent Award
- Winner of 2012 Nestlé Patent Award
- No 1 Market Leader Nestlé Toll House Award (2003)
- German Academic Exchange Service Award (DAAD, 1994)

## **SCIENTIFIC / NETWORK & ACADEMIC ACTIVITIES**

- Member of Nestlé Dispersions, Hydrocolloids, Creaminess, Clean Label and Beverages & Systems Expert Networks
- Member of Food Science Strategic Research Alliance, UMass, USA
- Fellow of the International Informatization Academy
- Member of American Chemical Society
- Member of Russian Mendeleev Chemical Society, Scientific Secretary of the Central Bureau
- Member of the Russian Scientific Committee on the Problem of Food Industry
- Invited speaker of several Symposia/Conferences
- Supervisor / co-supervisor of 8 PhD candidates