

# Edward W. Sheehan Ph.D.

## Title: Vice President & Principle Scientist

### Institution, Location and Degree

1972-1976	St. Bonaventure University, NY	BS in Biology
1977-1981	University of Pittsburgh, PA	BS in Pharmacy
1981-1990	University of Pittsburgh, PA	PhD in Pharmacology and Toxicology

### Positions and Honors

#### **Positions and Employment**

1988-1991	Senior Chemist, Application & Development, Extrel, Pittsburgh, PA
1990	Consultant, Extrel, Phase II, DOD Contract #15-86-C-0107
1992-1995	Scientist, Research & Development, Extrel/Waters
1995	Contractor/Consultant, ABB Extrel/Waters
1995-	Vice President & Co-Founder, Chem-Space Associates, Inc.

#### **Positions and Employment**

1988-1991	Senior Chemist, Application & Development, Extrel
1992-1995	Scientist, Research & Development, Extrel/Waters Corp.
1995-	Principal Scientist & Co-Founder, Chem-Space Associates

#### **Other Experience and Professional Memberships**

1981-	Register Licensed Pharmacist (Pennsylvania, RP-031953-L)
1988-	Member, American Society for Mass Spectrometry and American Chemical Society
1990	Consultant, ABB-Extrel, Phase II, DOD Contract # 15-86-C-0107
1992	Consultant, ABB-Extrel

#### **Commercial Product Development**

1988-1991	Benchmark™, Quadrupole LC/MS, Extrel Corp.
1992-1993	Electrospray LC/MS Interface, Extrel Corp.
1992-1994	Integrity™ Mass Detector, Waters Corp.

### Patents

#### **Electrospray LC/MS Interface**

1998	Method and Apparatus for Improved Electrospray, US Patent 5,838,002
2001	Electrospray for Chemical Analysis, US Patent 6,278,111

#### **Atmospheric Pressure Ionization**

2009	Remote Reagent Ion Generator, US Patent 7,569,812
2006	Laser Desorption Ion Source, US Patent 7,375,319
2007	Remote Reagent Chemical Ionization Source, US Patent 7,253,406
2006	Remote Reagent Chemical Ionization Source, US Patent 7,095,019
2006	Laser Desorption Ion Source, US Patent 7,087,898
2005	Remote Reagent Chemical Ionization Source, US Patent 6,888,132

#### **Atmospheric Focusing of Gas-Phase Ions**

2006	Laminated Lens for Focusing Ions from Atmospheric Pressure, US Patent 7,081,621
2006	Ion Enrichment Aperture Arrays, US Patent 7,060,976
2005	Laminated Lens for Introducing Gas-Phase Ions into the Vacuum Systems of Mass Spectrometers, US Patent 6,949,740
2005	Laminated Tube for the Transport of Charged Particles Contained in a Gaseous Medium, US Patent 6,943,347
2005	Ion Enrichment Aperture Arrays, US Patent 6,914,243
2004	Apparatus and Method for Focusing Ions and Charged Particles at Atmospheric Pressure, US Patent 6,744,041
2004	Laminated Lens for Focusing Ions from Atmospheric Pressure, US Patent 6,818,889

#### **Atmospheric Mass Analysis of Gas-Phase Ions**

2004	Apparatus and Method for Focusing and Selecting Ions and Charged Particles At or Near Atmospheric ..., US Patent 6,784,424
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#### **Fragmentation/Collision and Reaction Cell**

2004	Efficient Direct Current Collision and Reaction Cell, US Patent 6,781,117
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#### **Thin Film Production**

2005	Ion and Charged Particle Source for Production of Thin Films, US Patent 6,878,930
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### Selected peer-reviewed publications (see above listing under R.C. Willoughby)

### Research Support (see above listing under R.C. Willoughby also)

#### **Completed Research Support**

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DOD Contract#: **DAA-15-86-C-0107**

Date: 1990 thru 1991  
Consultant: E.W. Sheehan

The goal of this project was to evaluate the feasibility of using a mass spectrometer with an atmospheric pressure ionization source (APCI-MS/MS) as a real time monitor of chemical warfare agents during their incineration. Dr Sheehan's responsibilities included determining the chemical nature of possible mass spectral interferences and the operation of the instrument in various field-test in Utah, USA.

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