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Q&A Discussion

# UCT: A 30-Year Tradition of Excellence in Sample Preparation



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**S**olid-phase extraction is a powerful sample preparation tool that is widely used in application areas as diverse as forensics, toxicology, pharmaceutical, environmental, and food safety. *LCGC Magazine* contributing editor Kari Hallenburg spoke with Michael Telepchak, CEO of UCT Incorporated, about the intriguing story of his discovery of the concept of solid-phase extraction and its enduring impact in the field of analytical chemistry. Michael holds several chromatography patents. He is the co-inventor of the technique of solid-phase extraction, and he is the co-author of *Clinical and Forensic Applications of Solid Phase Extractions*.

## **LCGC: How did the concept of solid-phase extraction come to you?**

**TELEPCHAK:** It was a serendipitous accident. Tom Goode, Dr. Reginald Adams, and I were working for PerkinElmer at the time. Dr. Adams was developing instrumentation for steroid analysis, and Tom and I were responsible for making HPLC columns.

One afternoon in the laboratory, we accidentally spilled some HPLC column packing into one of Dr. Adams' test tubes with the steroid samples in it. He panicked and said that we had ruined his experiment. I suggested to him that if he just let the stuff settle to the bottom and pour it off in the morning, he would have his steroids back.

When I arrived in the office, there were three messages on my phone letting me know that, in fact, he didn't have his steroids back. It occurred to me that they were probably still stuck onto that HPLC column packing. I suggested that he throw some methanol in it and try it again. And, by jeeppers, there they were! And that was the first accidental solid-phase extraction (SPE) that was performed.

## **LCGC: How did you manage to develop that idea into a widely used commercial technology?**

**TELEPCHAK:** We presented the idea to PerkinElmer, but they informed us that they were an instrument company, not a chemistry company, and were not interested.

Tom and Dr. Adams then moved on to other endeavors, but they were instrumental in the discovery of solid-phase extraction. After a period of time and a lot of effort trying to figure out how to finance a project like this, I decided to execute some market research to see if this type of technology would apply to forensic toxicology. At that time, you were still allowed to do manufacturing R&D in your garage, which is what I did, and I found a toxicology lab that gave me instrument time to test the ideas.

In 1986, the toxicology barrier was finally broken, and the mixed-mode product that I'd developed qualified as the basis for a high-quality, easy-to-operate device that would extract analytes out of biological fluids, clean enough to put on a GC-MS. And that was the actual birth of the forensic toxicology market.

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**LCGC: Can you tell us what UCT's flagship product has been?**

**TELEPCHAK:** Our flagship product is the same one that we developed 30 years ago —the DAU (Drugs of Abuse in Urine) line. As we developed this product, we found that it also applied to therapeutic drugs and additional applications in pharmaceutical, environmental, and food safety markets.

**LCGC: Did you foresee the power this technology would provide in the sample preparation community?**

**TELEPCHAK:** We never saw it coming. One afternoon, one of my clients said to me, "Where were you? The Society of Forensic Toxicology held a meeting in Montreal, and everybody there was talking about your products."

That was when we realized that we had one of those rare products that takes off and grows very quickly. Product sales increased from about \$60,000 a year to in the millions in the matter of a year and a half. We knew then that this technology was something special and needed more exploration.

**LCGC: How has UCT evolved over the past 30 years to remain in touch with developing technology?**

**TELEPCHAK:** The basic product line is still intact. The DAU columns consistently provide high-quality and excellent results. To meet market demands for quicker extractions, we developed two additional lines: the Xcel line and the FAST line. FAST was developed to compete with dilute-and-shoot, an area we thought we had no chance in. Quickly thereafter, we realized there were other needs in the marketplace not being met other than SPE columns. UCT then began to supply additional sample preparation items such as buffers, enzymes for enzymatic hydrolysis, and HPLC columns. We established ourselves in developing products that people really need.

After spending a majority of our focus developing products geared towards the forensic science market, we decided, if we

could execute it that well for that particular segment, we could do it for others. Soon after, we successfully ventured into the agricultural and food safety markets with a product line called QuEChERS, which is now one of our fastest-growing products throughout the world. We also quickly moved into the pharmaceutical and environmental fields.

**LCGC: Can you tell us how the industry has changed over the past few years?**

**TELEPCHAK:** Today, there are a number of SPE-type products on the market. There is a version- a -month that comes out with somebody trying to capitalize on the concept. As these products are introduced, the comment is, "This is going to put SPE out of business." Thirty years later, we're still going strong. We've seen the reintroduction of several notorious technologies just under a new name for example, solid-liquid extraction, but there are still difficulties getting all of these concepts to perform as consistently as traditional SPE.

In HPLC, we've seen core-shell technology and the introduction of expensive HPLC-MS systems. Many labs will budget for this exclusive instrumentation by cutting out consumable SPE product costs and not do any clean-up. Soon there after, there is often a quick transition back to some type of solid-phase extraction when analysts not only find how much instrument down-time is being spent cleaning out all of the unaccounted-for matrix, but also see the costs add up in replacing parts.

**LCGC: Do you have any closing thoughts?**

**TELEPCHAK:** This was an exciting year. Along with marking our 30th anniversary, we were delighted to learn that the American Academy of Forensic Science included us in their "Six Decades of Milestones in Forensic Science" for the development of solid-phase extraction.

From our establishment in Horsham, PA. in 1986, United Chemical Technologies, Inc. (UCT) has evolved into a major competitor in the field of silica based solid phase extraction technology. Following the acquisition of the specialty chemical branch of Huls America (formerly Petrarch) in October of 1993, UCT was then able to expand into silane manufacturing. This allowed for a stronger internal influence over the production of our high-quality bonded phases. Aside from the key institution of vertical integration, UCT also has always been second to none in technical support and customer service.

Over the past 30 years, UCT has continuously evolved to remain in touch with developing technology and market demands through the expansion of their product offerings. In addition to sample preparation columns and well plates, we offer QuEChERS tubes, Selectra® HPLC columns, vacuum and positive pressure manifolds (PPM), Select® pH buffer pouches, Selectrasil® reagents and hydrolysis enzymes. UCT's extensive product diversity along with our dedicated employees and loyal customers have significantly shaped the company into what it is today. As we mark the significant milestone of 30 years in business, we not only remember where we started, but more importantly, we celebrate the contributions and successes that got us here. Here's to 30 more years of excellence in sample preparation.