

# High Throughput Liquid Chromatography Using Polymeric ProSwift Monolithic Bioseparation Columns

K. Flook, S. Rao, J. Thayer, S. Xie, and C. A. Pohl, Dionex Corporation, Sunnyvale, CA, USA

## INTRODUCTION

Speed and resolution are two competing performance factors in chromatography using conventional porous separation media. One feature is often achieved while the other is sacrificed. This is often the case during separation of proteins and peptides, since these large molecules exhibit low diffusivity which translates into higher mass transfer resistance. The net result is significant peak broadening especially at higher flow rates.

A new generation of styrene-based reversed-phase separation media from Dionex, ProSwift™ polymer monoliths, is designed to address the above problem. They contain a network of large pores in which separation is achieved primarily by convective flow rather than diffusive flow. Highly improved mass transfer rates allow high speed analysis without band broadening or significantly sacrificing resolution thereby improving throughput and productivity. The new ProSwift phases use a patented process to produce a well defined polymer monolith. An in-situ polymerization process allows excellent batch-to-batch reproducibility and column stability.

Separations can be achieved at high flow rates without loss of resolution. These columns have an excellent longevity and are stable over a wide pH range.

We discuss the performance of three columns; two recently introduced phases, RP-2H and RP-3U, as well as our newest introduction, RP-1S. Excellent separation of a wide variety of proteins and peptides is shown here.

## OBJECTIVES

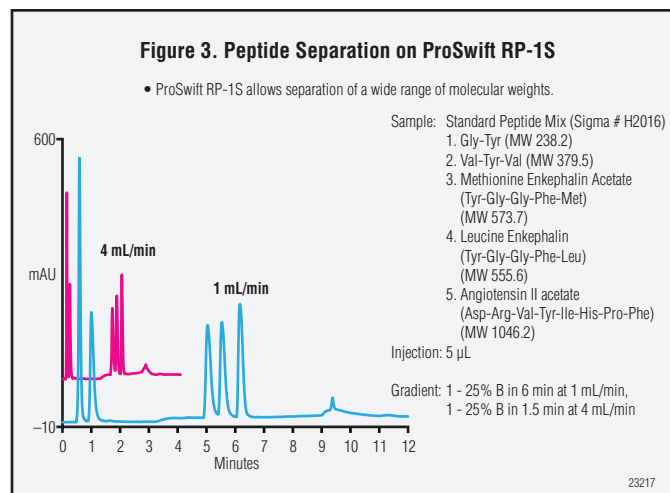
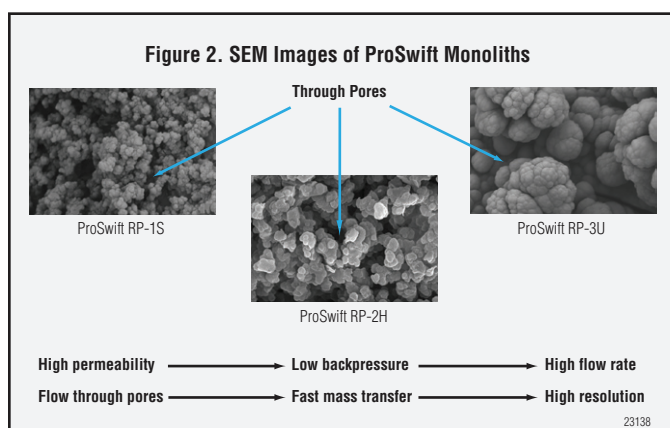
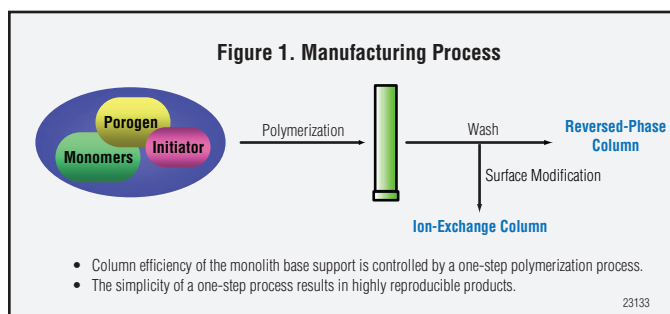
- Characterize the morphology and pore structure of the ProSwift monoliths.
- Investigate the chromatographic properties of the ProSwift monoliths.
- Develop applications for proteomic research.

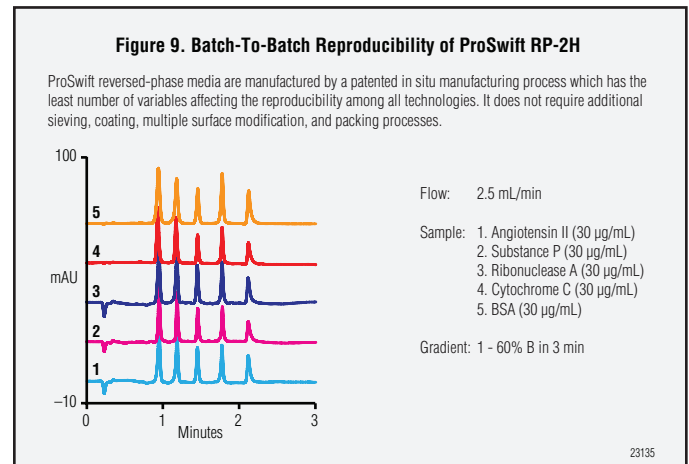
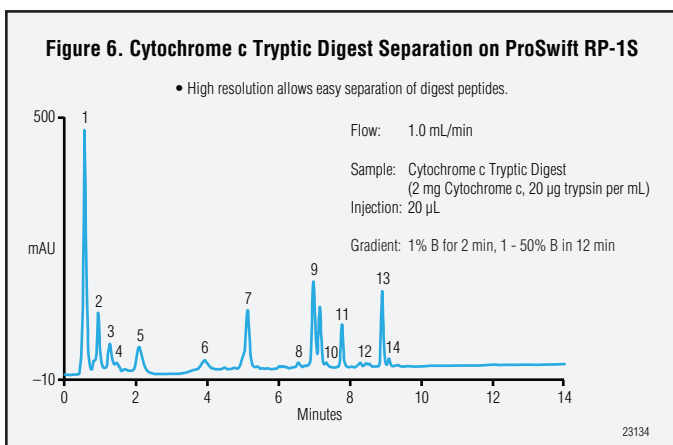
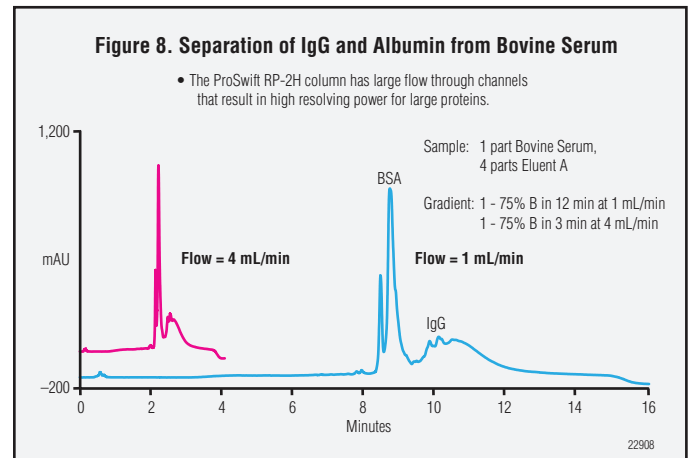
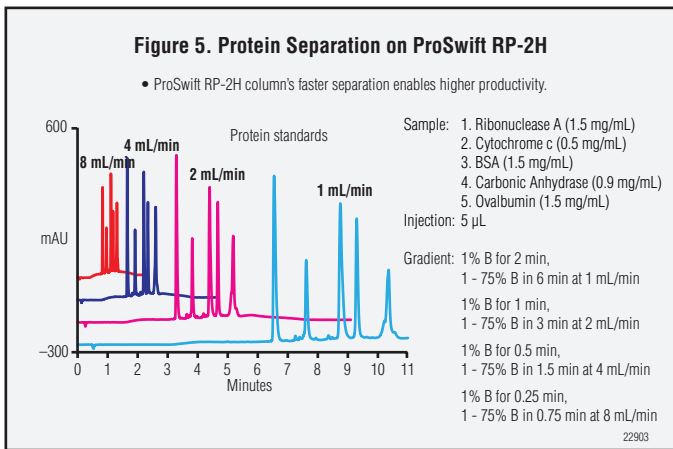
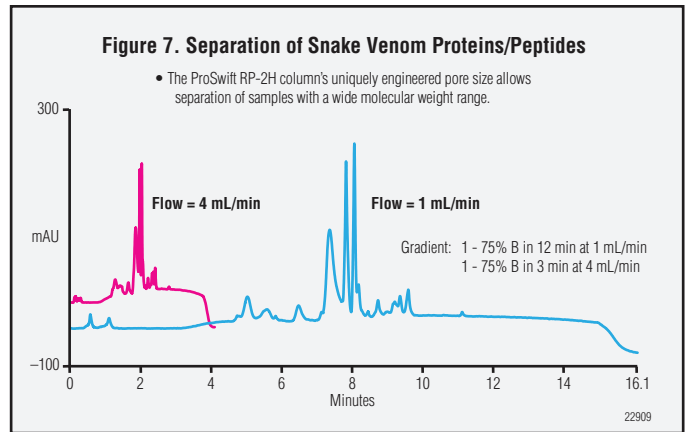
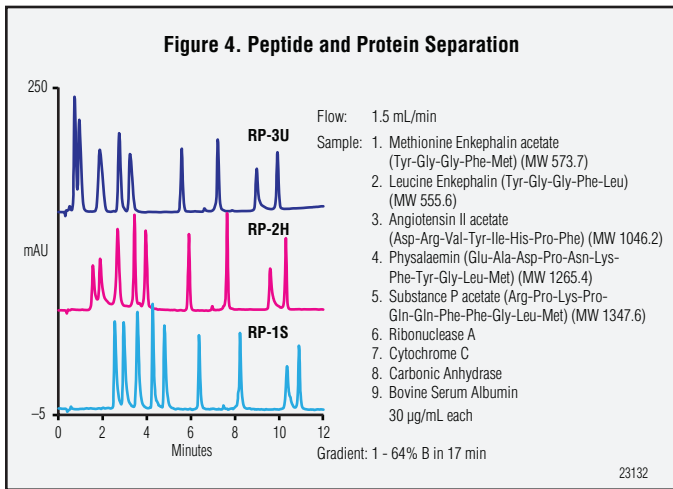
**Eluents:** (A) DI H<sub>2</sub>O / CH<sub>3</sub>CN (95:5 v/v) + 0.1% TFA  
 (B) DI H<sub>2</sub>O / CH<sub>3</sub>CN (5:95 v/v) + 0.1% TFA

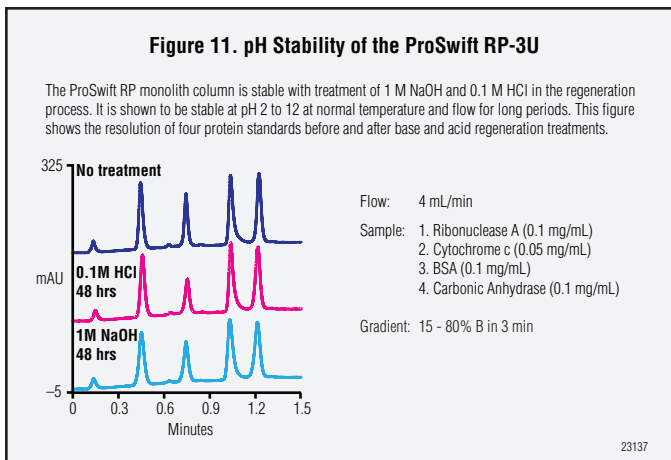
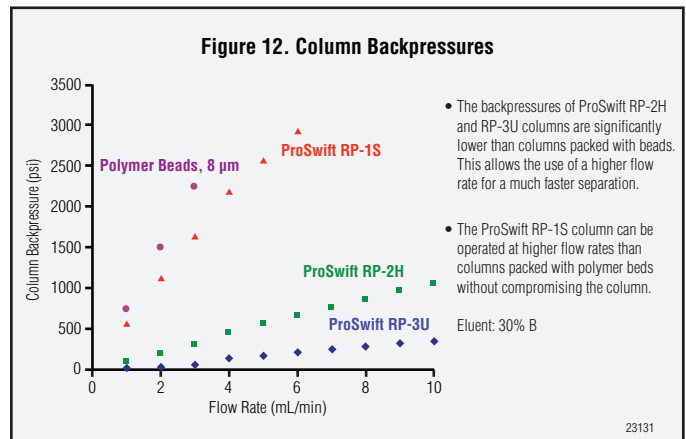
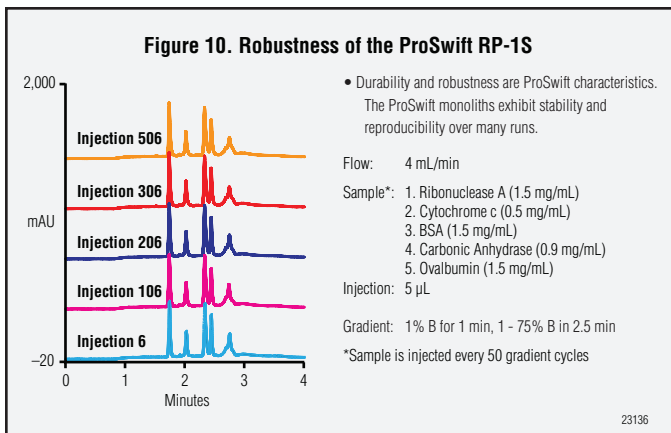
**Injection:** 10 µL (unless otherwise stated)

Now sold under the  
Thermo Scientific brand

**Thermo**  
SCIENTIFIC







## CONCLUSION

### Characteristics of Polymeric Monolithic Columns

- High resolution
- High flow velocity and low backpressure
- High capacity
- Highly reproducibility
- Much more chemically stable than silica-based media

### Applications

- High-throughput, high-resolution separation of proteins, peptides, and other biomolecules

## REFERENCE

[http://www1.dionex.com/en-us/columns\\_accessories/life\\_science\\_pharma/cons35517.html](http://www1.dionex.com/en-us/columns_accessories/life_science_pharma/cons35517.html)

ProSwift is a trademark of Dionex Corporation.

Passion. Power. Productivity.



#### Dionex Corporation

1228 Titan Way  
P.O. Box 3603  
Sunnyvale, CA  
94088-3603  
(408) 737-0700

#### North America

Sunnyvale, CA (408) 737-8522 Westmont, IL (630) 789-3660  
Houston, TX (281) 847-5652 Atlanta, GA (770) 432-8100  
Marlton, NJ (856) 596-0600 Canada (905) 844-9650

[www.dionex.com](http://www.dionex.com)

#### Europe

Austria (43) 1 616 51 25 Belgium (32) 3 353 4294  
Denmark (45) 36 36 90 90 France (33) 1 39 30 01 10  
Germany (49) 6126 991 210 Italy (39) 06 66 51 5052  
The Netherlands (31) 161 43 43 03  
Switzerland (41) 62 205 99 66  
United Kingdom (44) 1276 691722

#### Asia Pacific

Australia (61) 2 9420 5233 China (852) 2428 3282  
India (91) 22 28475235 Japan (81) 6 6885 1213  
Korea (82) 2 2653 2580



LPN 1862-01 06/06  
©2006 Dionex Corporation