

Table 1: CE Training Best Practices including Neutral Coated Capillaries Pros and Pitfalls: Going Beyond the mAb Separations

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Scope:

Capillary electrophoresis (CE) has become a routine instrumental technique applied in biochemical analysis. CE has gained considerable interest due to its high resolving power and efficiency of separation of mAbs and its derivatives. Proper CE analysis requires first and foremost proper training of the operator, including but not limited to CE theory, instrument theory and software theory. With a well-established theoretical background, an operator needs sufficient hands-on practical experience in the lab, including troubleshooting. As CE community we have developed a best practice for CE analysis, that is often lacking in theoretical courses. In this round table session, we will discuss CE training and best practice, and what is required to move beyond standard CE mAb analysis kits, with a focus on neutral coated capillaries.

Questions for Discussion:

Training best practices:

1. What lies at the basis of a proper CE analysis?
 - a. Theory: CE, instrument, software
 - b. CE best practice
 - c. Troubleshooting
2. What influences precision and accuracy of a CE method?
3. How to organize a CE training?
4. What cannot be captured in an SOP?

Beyond mAb separation

1. What else can we do with CE?
 - a. What examples are available?
 - b. *Go big or go home*: how large can we go?
2. Who needs to be convinced?
 - a. What is required for that?

Neutral coated capillaries: pros and pitfalls

1. When to use what coating?
 - a. What is compatible with MS?
2. What coatings are available and what do we know about them?
3. How to condition capillaries?

- a. What are best practices?
 - b. What is compatible with MS?
4. When to use what: covalent or non-covalent coatings?

Discussion Notes:

Eleven scientists participated the discussion. Key points were captured as following:

1: Common ways to organize CE training during pandemic:

- Virtual training including presentation, SOP, test methods, instrument manuals and software manuals;
- Video training for detailed experimental procedures;
- Lab hands-on training to be more familiar with the technique and instruments;

2: Applications of CE Beyond mAb separation:

- Small molecules, like Mannitol, sorbitol, galactitol, xylitol;
- Large molecules, like DNA, RNA, bi-specific, tri-specific and other protein molecules;

3: Common types of CE capillaries:

- Bare fused silica capillaries;
- Coated capillaries: neutral coated capillaries, cation coated capillaries;

4: Benefits of coated capillaries:

- Control or eliminate electroosmotic flow (EOF);
- Prevent undesirable adsorption of analytes onto the capillary inner surface;
- Increasing the reproducibility of the migration times, resolution, and peak efficiency;

5: How to choose a proper capillary:

- First, follow vendor's instruction;
- Choose the proper one according to the molecule;
- Method development for optimum dimension of the capillary