Limit batch to batch variation by tight control on all relevant process parameters

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In the regenerative medicine field, electrospinning is often the preferred production technique due to its capability to produce 3 dimensional fibrous ECM lookalike scaffolds with similar nano- to micrometer length scales using an extensive range of natural and synthetic polymers. The process is highly versatile and tunable, allowing to tailor scaffold properties to fit the demands of the various tissue to be engineered and regenerated.

Controlling all the parameters, which create the base of this method’s versatility, has proven to be a challenge, leading to a lot of inconsistencies and batch to batch variability. It’s of outmost importance to tightly control and log all relevant parameters. For example, the humidity affects the structural properties of the scaffold on the macro and micro level (Figure 1). Depending on the extend, these structural changes will have a large effect on the mechanical and biological properties of the scaffolds.

Keeping a tight control of the entire production process can be an approach to drastically reduce variability between and within a batch. In addition, this helps to simplify the standardization and characterization process.

References