QUALITY CHEMICAL LABORATORIES

Rapid, Science-Driven Success in Early Phase Pharmaceutical Development

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The pharmaceutical product and process development timeline can span many months to years depending on complexity. Picking the right contract partner early will not only make a big difference in reducing these timelines, but also in achieving a robust, compliant, scalable product. At QCL, we are dedicated to delivering science, compliance and quality into medicines while being a nimble, responsive CDMO partner.

Two of the most common customer complaints in the pharmaceutical space voiced by clients of CDMOs are timeliness and responsiveness. One may wonder why outsource in the first place. According to the 2020 Contract Manufacturing Survey conducted by Contract Pharma[1], the top factors influencing outsourcing decisions include internal resources limitations,

[1] https://www.contractpharma.com/issues/2020-03-01/view_features/2020-contract-manufacturing-survey/

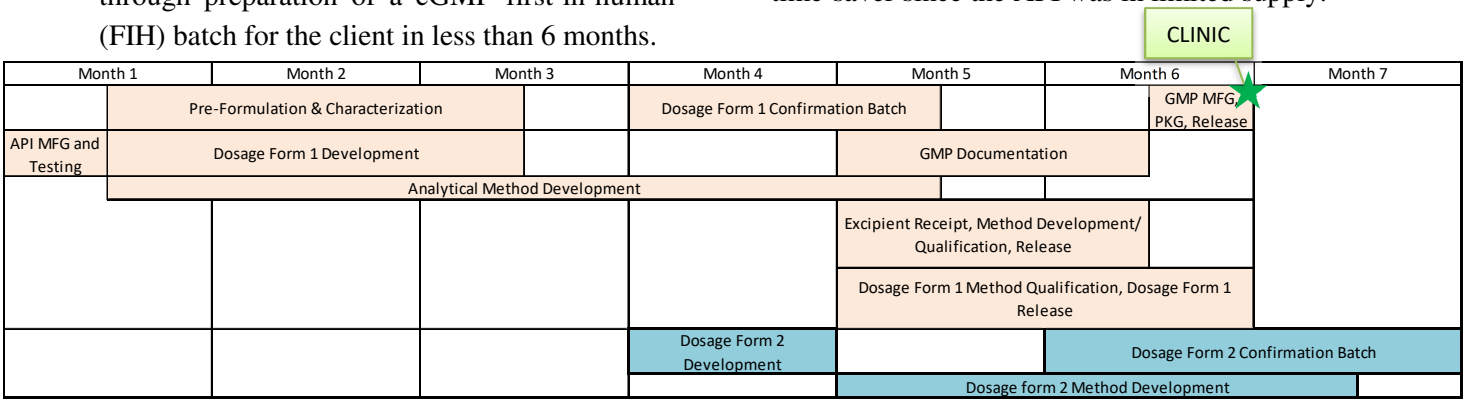
insufficient in-house expertise and/or wanting the ability to focus on other business priorities while achieving cost savings. While many CDMO's are driven by revenue, QCL's focus on science, getting things done right, responsiveness, and flexibility to adapt to changing needs are designed to fill capability gaps and contribute to building successful customer relationships.

In a recent novel drug development program for one client, QCL was able to achieve a beginning to end solution developing initial prototypes through preparation of a cGMP first-in-human (FIH) batch for the client in less than 6 months.

THE CHALLENGE: Develop at least one dosage form that avoids first-pass metabolism in the gut and all analytical methods using a limited quantity API.

THE STRATEGY: This program began with typical quality by design elements including excipient compatibility studies and API characterization allowing formulations development personnel to select the right excipients for initial prototype development. In fact, one excipient caused an API stability problem. Since the excipient compatibility study design was binary, the stability issue was easily isolated to a single excipient and eliminated from future formulation inclusion.

QCL's expertise in synthesis and analytical development is extremely valuable to achieving tight timelines. The synthesis team, led by QCL's owner, founder and president, Dr. Yousry Sayed, was able to provide API for formulation development and reference standard qualification activities. This was a tremendous time-saver since the API was in limited supply.



THE RESULT: As API was synthesized internally, analytical methods were developed, reference standards were qualified, and a scalable, specialized dosage form was produced, initially as a sublingual tablet.

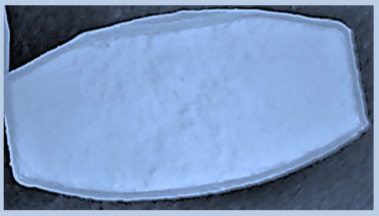
Taste-masking considerations combined with palatability, disintegration, minimal friability and tablet design were all important factors to successful product development. Process development with end-in-mind thinking noted potential future product scalability issues since some punch sticking was observed and required slower than typical tablet press speeds to process reliably. Prototype stability was initiated on the sublingual tablet confirmation batch, which is typically the last R&D batch produced to finalize the risk based approach to product technical transfer allowing cGMP batch record preparations, while a secondary dosage form and additional analytical methodology were developed for an enteric coated tablet dosage form.

After 1 month stability, a cGMP batch of the sublingual tablet was provided to the client for FIH studies. All this within 6 months of program start.

THE BACK-UP PLAN: Working with the client to fully understand the target product profile including patient population and desired dissolution profile were critical to developing a second enteric coated tablet dosage form. Initial dissolution challenges were encountered designing for a target delivery profile around pH 6.8-7.0 for delivery to the ileum to ascending colon region.

The analytical team and formulation development teams worked together along with

the coating vendor to troubleshoot dissolution profiles and successfully develop an enteric coated version for another FIH study for the client, providing multiple options to determine optimal pharmacokinetics as well as ideal patient acceptance.



THE CONCLUSION: Beginning with the end in mind is critical for scalability and future supply chain success. The ability to be nimble and responsive to client needs is achievable in QCL's highly collaborative team environment where science is at the forefront. A recent novel drug development program posed challenges to dosage form and process development targeting minimal first pass effect while providing multiple dosage form options with limited API supply. The combination of QCL's expertise in a variety of areas including API synthesis, analytical method development and qualification, and formulation development successfully met the client's timelines.

No program goes without set-backs and challenges, but it is how we respond to those that set us apart. In the words of Dr. Sayed: ***"If a customer has a problem, QCL has a problem***."

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