Notes:

Client information will contain all a client’s relevant information: name, group, phone, address. This would imply that there could exist multiple groups within a single company. Therefore, a client ID must be generated for each client/group combination to serve as a primary key. Each client/group can solicit multiple projects (contracts).

Each project contains the product information—usually a protein or lipopolysaccharide (LPS)—for the project; the type of process to be performed such as whether it will be process development or production and whether or not it is a GMP-type production; the specific GMP project identifier assigned to all GMP projects to protect privacy; project manager; project start and end dates; and the contract number as the primary key.

A project may require multiple products. For example, a vaccine process development project could contain a LPS product, a protein product, and a final conjugated product. Product description (LPS or protein etc), cell types to be grown (eg E.coli or Vibrio cholerae), and if specified media type and antibody tags are defined within the product entity.

Each project will likely contain multiple production lots. For example, a simple protein production project could require the plasmid transformation into E.coli, the generation of glycerol stocks or research cell bank, and production of raw protein via cellular induction, and conjugation and purification of final protein product. Note: downstream conjugation and purification procedures are not the purview of this database project. Production lot number as primary key, production type (shake flask, bioreactor, glycerol stock production, etc.), cell and media type, whether or not the media is from a non-animal source, and production start and finish dates are part of this entity.

Media type and cell type are included as separate entities to simplify the ERD. Direct connection of production lot to Materials would be unwieldy and un-useful. Whether or not both cells and media are GMP grade is included in entities. Note: GMP (good manufacturing practices) imply more stringent requirements and must be cleared by QA/QC. Having such information directly available would be advantageous.

And finally the Materials entity contains basic information to aid in ordering more of a specific chemical, media, and competent cell type