

# MOLECULAR DIMENSIONS MONOGRAPH SERIES<sup>®</sup>

## Selecting Plates & Covers

24 Well – the traditional approach.

The traditional choice for setting up crystallisation trials has been the 24 well Linbro style plate, which is actually an obsolete tissue culture plate. The main advantage offered by this plate is that the well spacing is sufficiently large to allow cover slips to be manipulated on and off greased well rims. Raised lid designs, such as the XRL plate, avoid the need to use plasticine (modelling clay) on the corners to prevent the lid from crushing the cover slips. These plates can be used for hanging drop vapour diffusion with cover slips and sitting drop with a bridge.

Alternative designs, with a larger footprint, were introduced by Crystal Systems which avoid the use of sealing grease by introducing a ledge or pillars to support a cover slip inside the well rim. These Q or QII plates can be sealed with transparent tape.

Several users have preferred to use smaller plates for space saving reasons and adopted standard 24 well plates and 18 mm cover slips. The footprint now available for multiwell plates from labware suppliers was standardised internationally and is referred to as the SBS format (Society for Biomolecular Screening). A raised lid 24 well version is now available (Combo Plate) and can be used for hanging drop and sitting drop with a bridge that also fits the larger Linbro Style XRL plate.

Siliconised (or more correctly silanised) glass cover slips are typically used for setting up hanging drop vapour diffusion experiments. Whilst highly suited to this technique manufacturers have found it difficult to obtain clean raw material glass on a regular basis. Molecular Dimensions has found a German supplier to be the most reliable both in terms of cleanliness and lack of glass shards left over from the cutting process.

A popular alternative to silanised glass is a clean and optically clear plastic. Molecular Dimensions supply cover slips of this material under the name CrystalClene™ slips. These cover slips do not require silanisation, are guaranteed clean, dust free and are RNase free. Another advantage is that they are unbreakable.

96 well plates.

With the application of robotics to setting up crystal growth trials a number of 96 well SBS format plates have been introduced, and even higher density plates. In reality any of these plates with one protein drop position per well on a 96 well plate can be set up manually; whilst higher density plates (2 and 3 drop and 384 well) plates must be set up with a robot.

Plates are available to set up sitting drop and microbatch in the SBS 96 well format, and hanging drop can be set up on adhesive cover sheets on a standard flat bottom 96 well plate.

Here are some of the issues to bear in mind when choosing a plate design.

- Small protein drops in relatively large drop wells have a tendency to “run” to the sides, especially where there are edges and corners. Round drop positions may therefore be more favourable than square ones if you are intending to use small drops.
- You will have to observe your drops under a microscope. All trays have their own characteristic optical properties because they are injection moulded. Small shapes and corners in plastic trays tend to exhibit dark fields.
- Round drop well shapes may have lens effects; look for flat bottoms or other compensating well base shapes.
- You will wish to recover any crystals that form so the protein drop should not be too far below the upper surface of the tray, so that there is a good shallow angle for approaching the drop with a loop for cryo mounting.
- The surface properties of the plastics are also important with respect to drop behaviour. New materials and coatings are being introduced to address such issues as birefringence and hydrophobicity.

Molecular Dimensions recommends the MRC Crystallisation Plate.