CapitalBio SmartGrid™

Cat. No. 430031-430033

CapitalBio SmartCover™

Cat. No. 430041-430044

CapitalBio SmartStick™

Cat. No. 430081-430082

CapitalBio SmartPress™

Cat. No. 430090

User Manual

For Laboratory Research Use Only

Not for Diagnostic Purposes

CapitalBio Corporation

General Introduction

CapitalBio SmartGrid™ and CapitalBio SmartCover™ have been both developed to aid high throughput processing of multiple samples (4, 8, 10 and 12 samples) together on a single microarray slide under identical conditions (Fig. 1). SmartGrid™ safely separates different samples added to individual blocks, avoiding cross-contamination; while SmartCover™ helps to distribute the reagent solution evenly inside each block, enhancing signal repeatability and minimizing variability of hybridization or immunoreaction. Using SmartCover™ can also simplify the manual addition of solutions to the microarray.

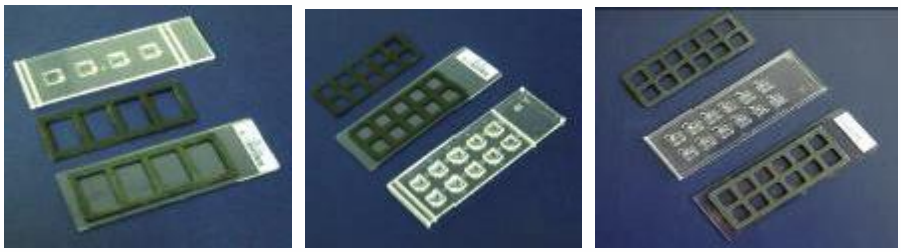

Fig. 1. CapitalBio SmartGrid™ and SmartCover™

Precise positioning and adhesion of the SmartGrid™ grid is required to create a compartmented slide and avoids any possible damage to the printed spots during this process. CapitalBio SmartStick™ multi-sample grid alignment tool aids aligning the grid to the slide surface in the correct position. CapitalBio SmartPress™ is a grid pressing tool which ensures good adhesion of the grid with slide surface. The combined use of these two tools guarantees firm accurate positioning and strong adhesion of the multi-sample grid on the slide surface. This prevents any possible cross-contamination caused by liquid sample leakage.

(a) **(b)**

Fig. 2. (a) CapitalBio SmartStick™ and (b) CapitalBio SmartPress™.

Recommended Protocol

1. **Probe printing**

Perform probe printing on the microarray before attaching the adhesive grid. SmartGrid™ dimensions are given below (Fig. 3) for printing reference. When laid down on the microarray spotter platform, it is recommended to use the top left corner of the slide as the printing starting point.

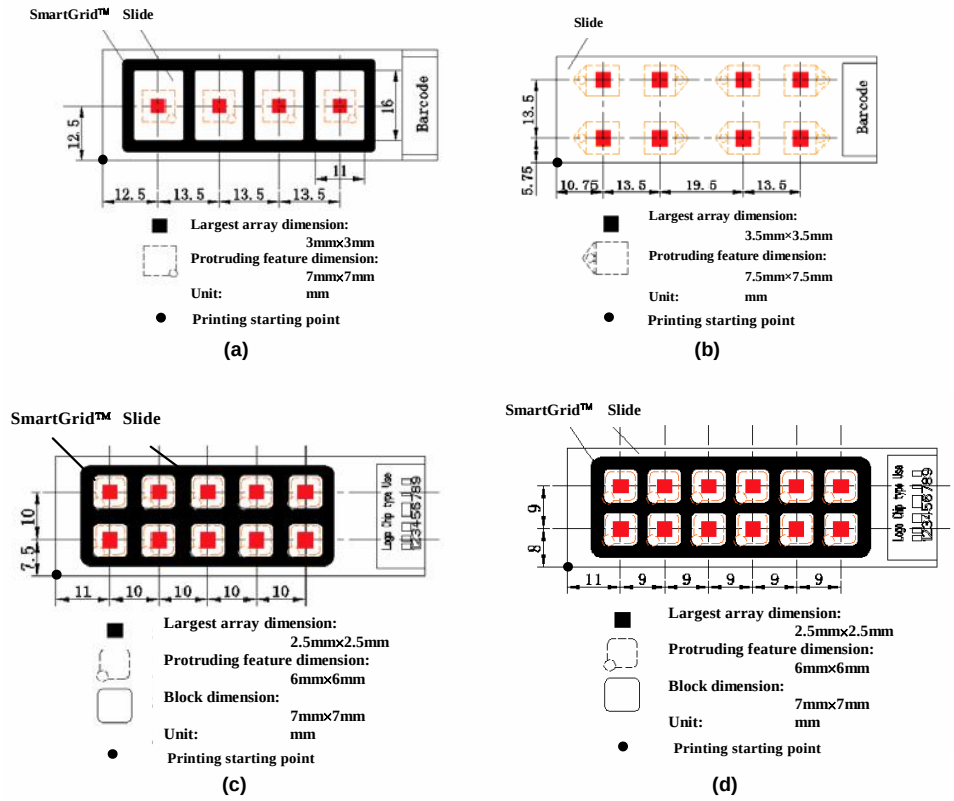

Fig. 3. Printing reference for using (a) 4-sample SmartGrid™/SmartCover™, (b) 8-sample SmartCover™, (c) 10-sample SmartGrid™/SmartCover™ and (d)12-sample SmartCover™/SmartCover™.

2. SmartGrid™ adhesion

Select the appropriate SmartStick™ for the SmartGrid™ being used. For 4-sample grid, use SmartStick™-A (Cat. No. 430081); for 10- and 12- sample grids, use SmartStick™-B (Cat. No. 430082). Note: To better fit the slide, the width of the trough could be adjusted by reposition the lower black strips controlled by the 3 bolts, if using the top left point of the slide as the printing starting point.

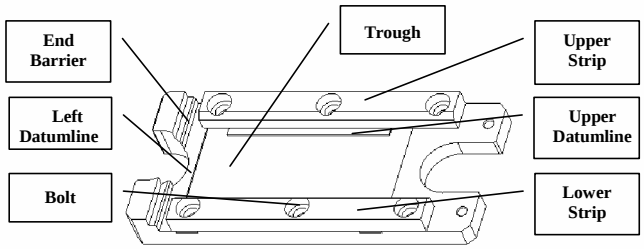

Fig. 4. SmartStick™ features

2.1 Remove the protecting kraft paper from the SmartGrid™ (Fig. 5). Be careful not to damage the glue layer. If the grid sticks to your hand, do not pull hard. Tweezers can be used to grip the non-adhesive edges of the grid and place it into the trough (Fig. 6).

Fig. 5. Removing the Kraft paper from the SmartGrid™.

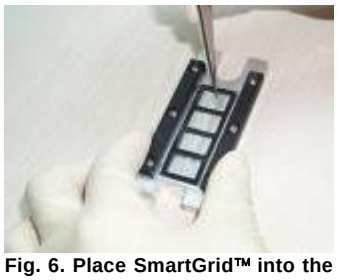

Fig. 6. Place SmartGrid™ into the trough.

2.2 Put the grid into the trough with the glue layer facing up. Level the left and upper side of the grid to the left and upper datumline, respectively (Fig. 6).

2.3 Carefully place the microarray slide into the trough with the **spotted-side facing down**. Firstly, place the end without the barcode flush to the raised end barrier, then slowly lower the slide into the trough, aligning the edge with the black guide strips (Fig. 7). Progressively contact the grid positioned in the trough until the right-hand barcoded end of the slide is lowered fully onto the grid.

2.4 **Important!** Carefully press on the back of the slide with the forceps to ensure contact with all glued surfaces (Fig. 8). Be careful not to press too hard as to damage the slide.

Fig. 7. Microarray slide alignment in the SmartStick™.

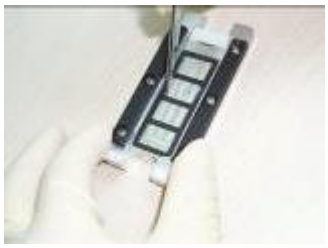

Fig. 8. Pressing with a forceps.

2.5 Check by eye to see if the grid is aligned correctly on the slide and that the grid is firmly adhered to the slide before removing the slide from the SmartStick™.

2.6 Place the slide into a trough of the SmartPress™ with gridded-side facing upwards. Holding the SmartPress™ template with one hand, press the grid firmly home against the slide surface with 2-3 uniform motions of the roller (Fig. 9).

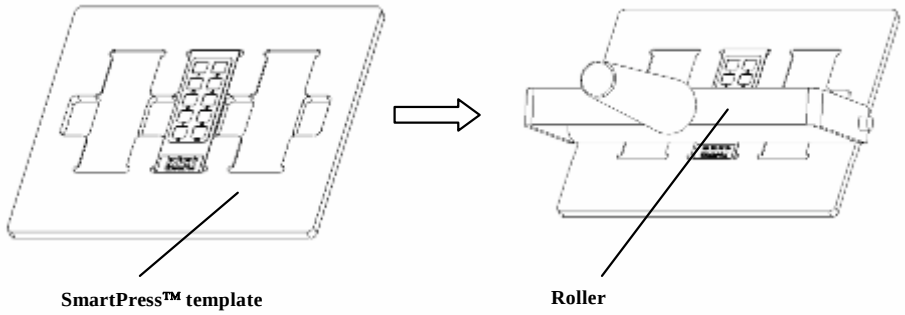

Fig. 9. Press the grid home with SmartPress™.

3. SmartCover™ positioning

Remove the PE film packing of SmartCover™. If plastic fragments are found on the SmartCover™, blow them off with an air puffer. Place the microarray slide in an appropriate reaction cassette with the printed side facing up (Fig. 10).

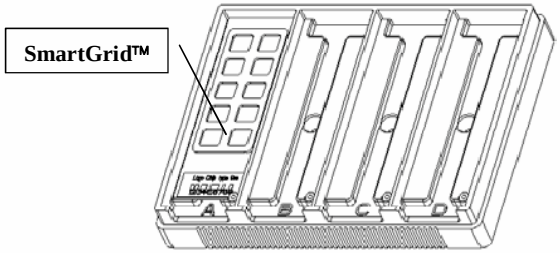

Fig. 10 Positioning of slide with SmartGrid™ in IncuSet™ protein incubation cassette.

Put the SmartCover™ onto the slide. Make sure that the side with the protruding features faces down (Fig. 11).

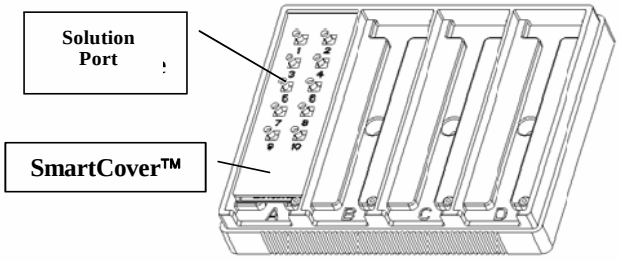

Fig. 11. Positioning of SmartCover™ on the slide in IncuSet™.

4. **Reaction reagent addition**: Take up the reagent solution using an appropriate pipette. Put the pipette tip vertically into the solution port at the corner of each block of SmartCover™. When the tip just touches the slide surface, slowly release the solution to fill the space between the protruding features and the slide surface (Fig. 12). Take care to not introduce bubbles. The recommended reagent volumes are listed in Table I.

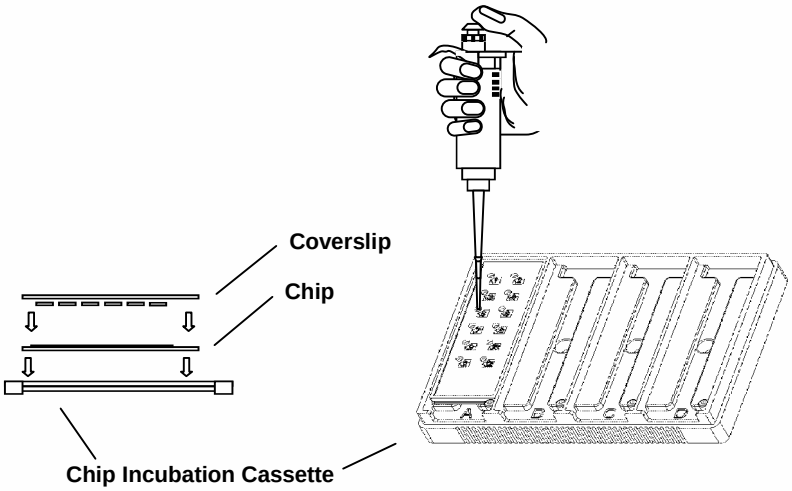

Fig. 12. Schematic diagram of manipulation.

Table I. Recommended reagent volumes for each block of SmartCover™

Type of SmartCover™	Reagent Volume (μl)
4-sample	13.5
8-sample	18
10-sample	20-30
12-sample	20-30

Maintenance

1. CapitalBio SmartGrid™ and SmartCover™ are one-use consumables. Repeated usage is not recommended.
2. CapitalBio SmartStick™ and SmartPress™ should be cleaned with a clean piece of towel or tissue paper.
3. Store all items carefully in a cool and dry place and avoid contact with water, oil and other chemicals.
4. After using for a period of time, check the SmartStick™ to ensure the 6 bolts have not loosened. Retighten the bolts with an appropriate screwdriver, if loose.

Information

Chip Hybridization. For convenience and high signal reliability, hybridization is best performed using a CapitalBio BioMixer™ II Microarray Hybridization Station (Cat. No. 120030) and HybSet™ Microarray Hybridization Cassette (Cat. No. 420010) which both help to reduced edge-effects. The enhanced quality of hybridization is attested in recent publications such as Patterson *et al* (2006) *Nature Biotechnol*ogy 24:1140-1150 and Shi *et al* (2006) *Nature Biotechnology*, 24:1151-1161.

CapitalBio Corporation

18 Life Science Parkway
Changping District
Beijing 102206
P. R. China
Tel: 86-10-80726868
Fax: 86-10-80726782
globalsales@capitalbio.com
www.capitalbio.com