**Supplementary Material**

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| **Reagents** | **Final concentration** | **Reaction**  |
| **Asymmetric PCR (50 μL)** |
| AccuPrime PCR buffer II 10x  | 1x |  |
| Primer A or D  | 600 μM |
| Primer B or C  | 60 μM |
| AccuPrime Taq 2 U/μL  | 0.01 U/μL |
| Chromosomal DNA | 100 ng |
| ddH2O | X μL |
| **Pre-AD PCR (48 μL)** |
| AccuPrime PCR buffer II 10x  | 1x |  |
| AB amplicon | 100 ng |
| BC amplicon | 100 ng |
| AccuPrime Taq 2 U/μL  | 0.01 U/μL |
| ddH2O | X μL |
| **AD PCR (50 μL)** |
| Pre-AD PCR | 48 μL |  |
| Primer A  | 100 μM |
| Primer D | 100 μM |
|  **EF PCR (50 μL)** |
| Biotaq PCR buffer 10x  | 1x |  |
| MgCl2 50 mM | 2 mM |
| dNTPs 10 mM | 0.2 mM |
| Primer E  | 0.5 μM |
| Primer F  | 0.5 μM |
| Biotaq 5 U/μL  | 0.025 U/μL |
| Lysed colonies | 1 μL |
| ddH2O | X μL |
| **pDM4 PCR (50 μL)** |
| Biotaq PCR buffer 10x  | 1x |  |
| MgCl2 50 mM | 2 mM |
| dNTPs 10 mM | 0.2 mM |
| Primer pDM4for | 0.5 μM |
| Primer pDM4rev | 0.5 μM |
| DMSO | 10% |
| Biotaq 5 U/μL  | 0.025 U/μL |
| Lysed colonies | 1 μL |
| ddH2O | X μL |