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HTS(High-throughput screening) system for development of herbicides, antibiotics, and andtimalarial, and andtihyperlipemia drugs

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Isoprenoids, a diverse group of compounds derived from the five-carbon units isopentenyl diphosphate(IPP) and its isomer dimethylally diphosphate(DMAPP), are essential for survival in all organisms. Eukaryates, partial bacteria and so on synthesize isoprenoids from Mevalonate pathway, on the other hand, proakryates and malaria parasite synthesize isoprenoids from MEP(nonmevalonate) pathway. By contrast, plants use both the MEP pathway and the Mevalonate pathway for isoprenoids biosynthesis, although they are localized in different compartments.

Fosmidomycin inhibits *DXR* activity of MEP pathway, and simvastatin inhibits *MvaA* activity of Mevalonate pathway. Therefore, these two-compound were used to confirm our screening system. Specific inhibitors of MEP pathway are expected to be antibiotics, malaria remedy and herbicides which obstruct a chloroplast's photosynthasis. Specific inhibitor of Mevalonate pathway can be used for treating a variety of hyperproliferative and inflammatory mucocutaneous disorder, including basal cell carcinoma, squamous cell carcinoma, psoriasis, and atopic dermatitis as well as skin irritation and disorders associated with skin aging and skin photodamage. This contrivance is method for screening a substance capable of inhibiting either or both of the Mevalonate pathway and MEP pathway using a host cell transformed with a DNA encoding all enzymes associated with a foreign mevalonate pathway and having an inactivated indogenous nonmevalonate pathway. *E.coli* DH5a is used to be MEP pathway, and *E.coli(⊿dxr)* harboring pDSNSA12i야 is used to be Mevalonate pathway. Screening of 325 compounds from Korea plant extract bank resulted in 1hit of *DXR*'s inhibitor of MEP pathway, and resulted in 2hits of *MvaA*'s inhibitor of Mevalonate pathway. Screening

of 8,240 compounds from Korea chemical bank resulted in 5 hits of *DXR*'s inhibitor of MEP pathway, and resulted in 22hits of mvaA's inhibitor of Mevalonate pathway. Screening of 2,880 compounds from Microbial Genomics & Applications Center resulted in 1hit of *DXR*'s inhibitor of MEP pathway, and resulted in 11hit of *MvaA*'s inhibitor of Mevalonate pathway.

Future work should be directed to identify new inhibitor that could be developed into potent drugs.