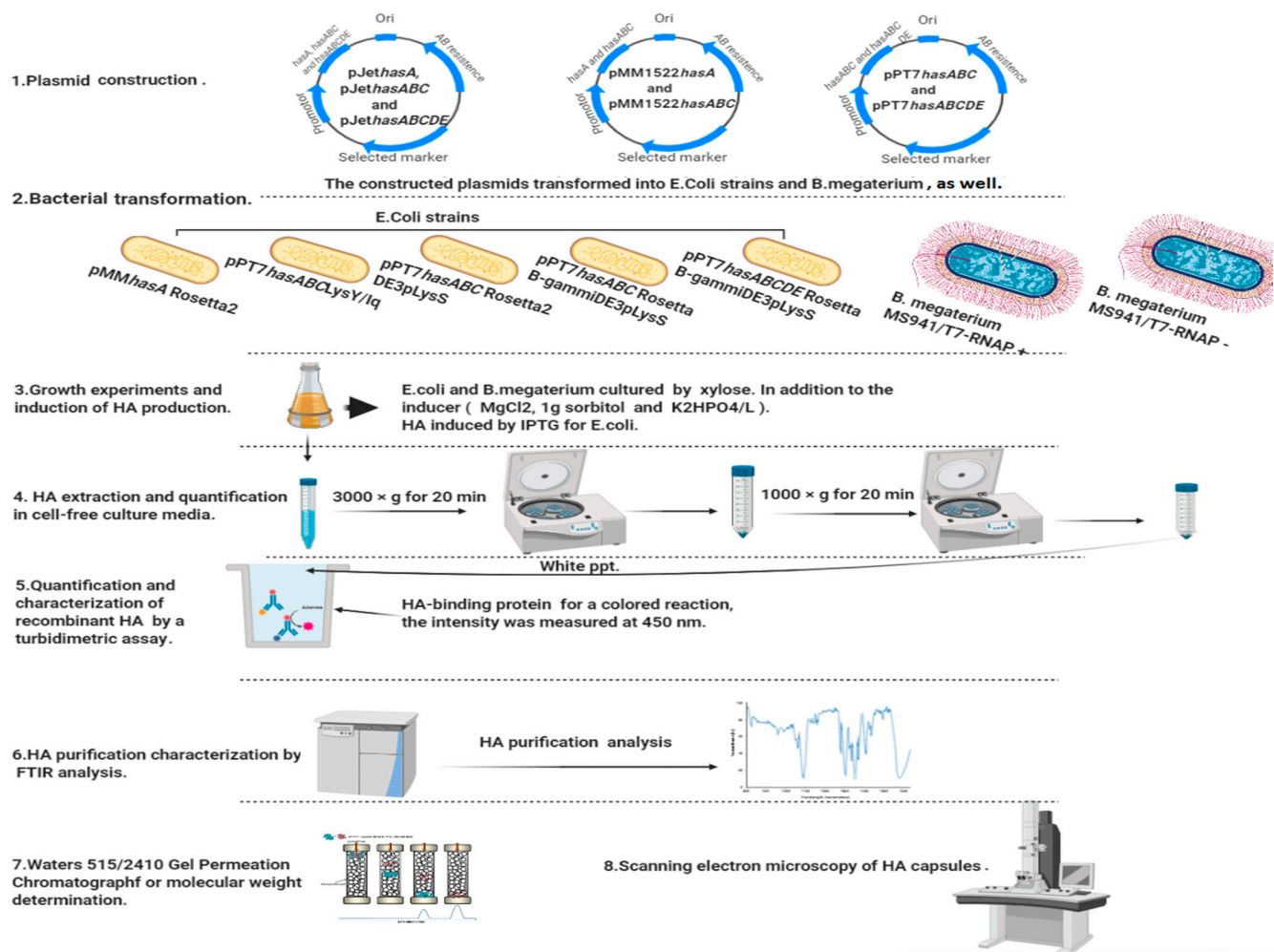


**Table S1.** Selection of HA producing *E.coli* Colonies.

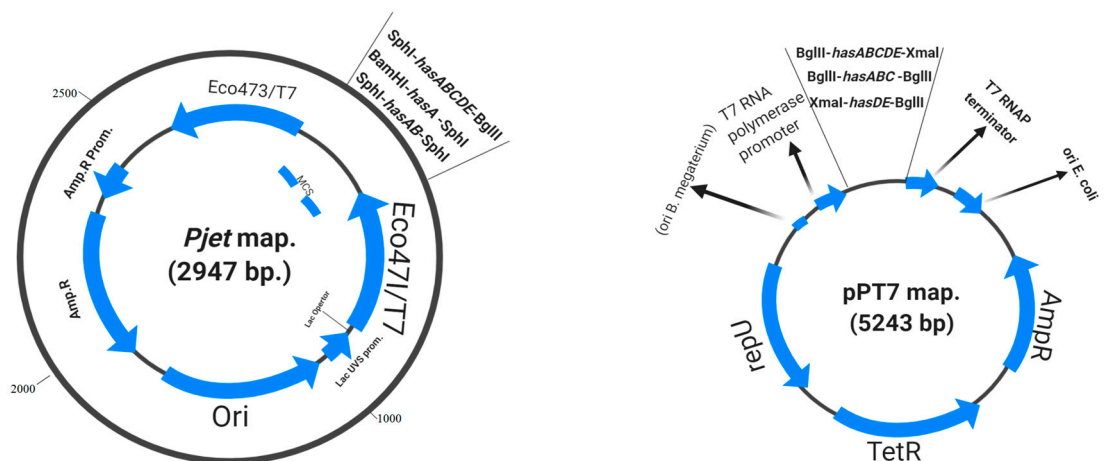
Strain	Plate one	Plate two	Plate three
pMM <i>hasA</i> Rosetta2	LB+glucose1%+chl oramphenicol34ug/ ml	LB+glucose1% +0.5%Xylose	LB+glucose1%+0.5%Xylose + Ampicillin100ug/ml
pP <sub>T7</sub> <i>has ABC</i> <i>LysY/Iq</i>	LB+glucose1%	LB+glucose1%+0.5 mM IPTG	LB+glucose1%+1mM IPTG+ Ampicillin100ug/ml
pPT <sub>7</sub> <i>hasABC</i> Rosetta2 DE3pLysS	LB+glucose1%+ chloramphenicol 34ug/ml	LB+glucose1%+0.5 mM IPTG + chloramphenicol3 4ug/ml	LB+glucose1%+ Chloramphenicol 34ug/ml +1mM IPTG+ Ampicillin100ug/ml
pPT <sub>7</sub> <i>hasABC</i> Rosetta B- gammiDE3pLysS	LB+glucose1%+ chloramphenicol34 ug/ml	LB+glucose1%+0.5 mMIPTG + chloramphenicol3 4ug/ml	LB+glucose1% + Chloramphenicol 34ug/ml +1mM IPTG+ Ampicillin100ug/ml
pPT <sub>7</sub> <i>hasABCDE</i> Rosetta B- gammiDE3pLysS	LB+glucose1%+ chloramphenicol34 ug/ml	LB+glucose1%+0.5 mMIPTG + chloramphenicol3 4ug/ml	LB+glucose1% + Chloramphenicol 34ug/ml +1mM IPTG+ Ampicillin100ug/ml

**Table S2.** List of oligonucleotides.

Primers Name	Sequence ( <u>Restriction sites</u> )	Purpose
Forward <i>hasA</i> pJet	ATCGGATCCTGAGGAGACACAACATGAGAACATTA AAAAACCT ( <i>Bam</i> HI).	Cloning in pJet and pMM1522
Reverse <i>hasA</i> pJet	AGAATTGAGGCTCTTATAATTTTTTACGTGT ( <i>Sph</i> I).	Cloning in pJet and pMM1522
Reverse <i>hasAB</i> pJet	TTCTGAGAGGCTCTAGTCTCTTCCAAAGAC ( <i>Sph</i> I).	Cloning in pJet and pP <sub>T7</sub>
Reverse <i>hasABC</i> pJet	TATCGGCATGCTTACTGGGGCTGATC ( <i>Sph</i> I).	Cloning in pJet and pP <sub>T7</sub>
Forward <i>hasABCDE</i> pP <sub>T7</sub>	ATAATCAGATCTGAGGAGACACAACATGAGAACAT TAAAAACCT ( <i>Bg</i> /II).	Cloning in pP <sub>T7</sub>
Reverse <i>hasABC</i> pP <sub>T7</sub>	ATAATCAGATCTTTACTGGGGCTGATC ( <i>Bg</i> /II).	Cloning in pP <sub>T7</sub>
Reverse <i>hasABCDE</i> pP <sub>T7</sub>	ACTGATCCCGGGTTACAAGCGTGC ( <i>Xma</i> I).	Cloning in pP <sub>T7</sub>



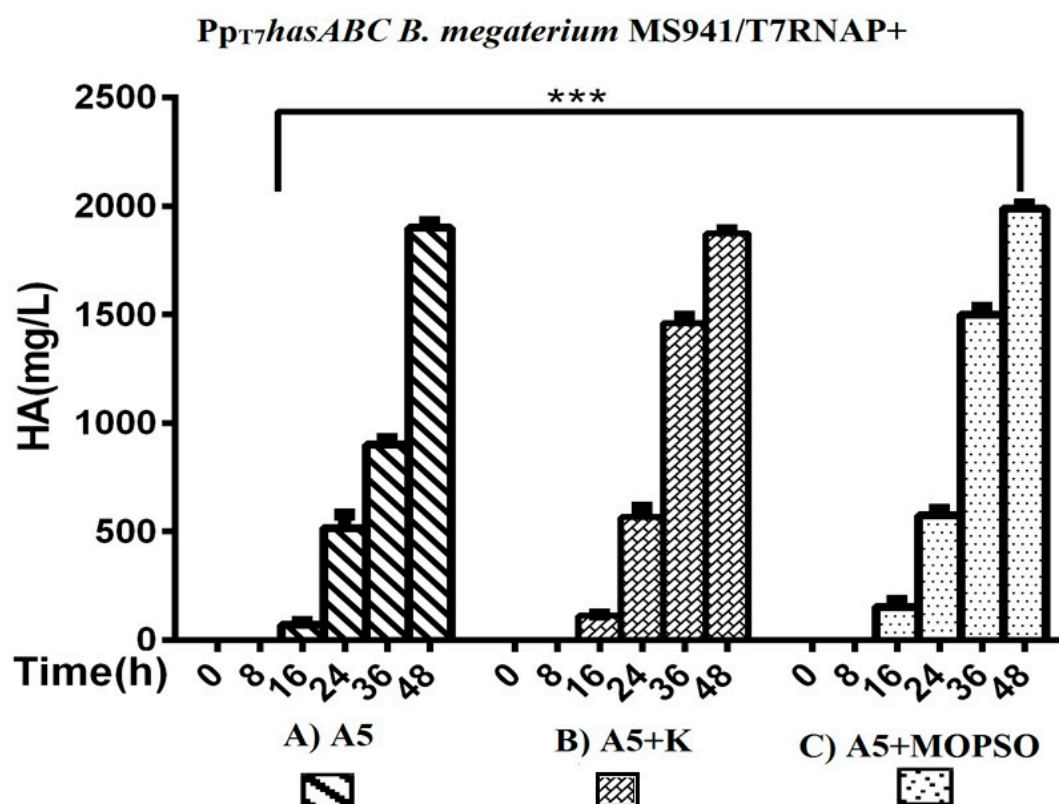
**Figure S1.** The graphical abstract of Materials and Methods.



**Figure S2.** Plasmid construction of *hasaABC/DE* cloned into Pjet and pPT7

**Table S3.** Selection of HA producing *Bacillus megaterium* MS941 Colonies

Strain	Plate One	Plate Two	Plate Three
pMM1522 <i>hasA</i> in <i>B. megaterium</i> MS941	LB + glucose 1 %	LB + glucose 1 % + 0.5 % Xylose	LB + glucose 1 % + 0.5 % Xylose + tetracycline 4 ug/ml
pP <sub>T7</sub> <i>has ABC</i> in <i>B. megaterium</i> MS941 pretransformed with T7RNAP.	LB + glucose 1 % + chloramphenicol 3.4 ug/ml	LB + glucose 1 % + chloramphenicol 3.4 ug/ml + 0.5 % Xylose	LB + glucose 1 % + chloramphenicol 3.4 ug/ml + 0.5 % Xylose + tetracycline 4 ug/ml
pP <sub>T7</sub> <i>has ABCDE</i> in <i>B. megaterium</i> MS941 pretransformed with T7RNAP	LB + glucose 1 % + chloramphenicol 3.4 ug/ml	LB + glucose 1 % + chloramphenicol 3.4 ug/ml + 0.5 % Xylose	LB + glucose 1 % + chloramphenicol 3.4 ug/ml + 0.5 % Xylose + tetracycline 4 ug/ml



**Figure S3.** HA production by pP<sub>T7</sub>*hasABCDE* *B. megaterium* MS941 pre-transformed with T7RNAP in (A) A5, (B) A5 + K and (C) A5 + MOPSO, (\*\*\*) : P < 0.0001.

**Table S4.** FTIR peaks; reference HA-standard FTIR, and HA produced by pP<sub>T7</sub>hasABCDE *E. coli* Rosetta-gami B pLysS and pP<sub>T7</sub>hasABCDE *B.*

Wave length (cm <sup>-1</sup> )	Functional group
3600-3604	confirms the presence of OH stretching
2897.89-2936.59	C-H stretching
1612.79-1653.02	Presence of amide II group
1410.64-1414.68	presence of C-O group with C=O combination,
1042.30-1058.73	C-O-C stretching
612.32-555.39	C-O-C stretching
3600-3605	confirms the presence of OH stretching
2897.89-2937.73	C-H stretching
1612.79-1650.02	Presence of amide II group
1410.64-1425.93	presence of C-O group with C=O combination,
1042.30-1058.49	C-O-C stretching
612.32-520.39	C-O-C stretching