Claims

1. A method of generating NRPS containing an assembly of two or more exchange units (EU), comprising an EU encoding a polypeptide comprising an A domain followed by a T and a C domain.

2. The method of claim 1, wherein the first EU of the assembly has an additional C domain in front of the first A domain.

3. The method of claim 1, wherein the last EU of the assembly is composed either of an A, T and TE domain.

4. The method of claim 1, wherein the last EU of the assembly is a TE domain.

5. The method of claim 4, wherein the previous EU to the last EU of the assembly is composed of an A and T domain.

6. The method of any one of claims 1-5, wherein Cy or C_{term} domains can replace C domains.

7. The method of any one of claims 1-6, wherein modification domains as E, MT or Ox can be added to the EU.

8. The method of any one of claims 1-7, wherein the assembly of EU is composed by EU domains derived from species as but not limited to bacteria, fungi or plants.

9. The method of claim 8, wherein the substrate specificities from C domain from particular species and the A domain of the following EU from another species has to be the same or related.

10. The method of any one of claims 1-9, wherein the assembly of the EU can be achieved by methods of molecular biology as but not limited to Gibson cloning or Yeast based TAR-cloning.

11. The method of any one of claims 1-10, wherein the borders between the EU domains are defined by the consensus sequence Trp-Asn-Ala-Thr-Glu within the C-A linker.

12. The method of any one of claims 1-11, wherein the NRPS contains PKS, or NRPS- PKS EUs.

13. The method of any one of claims 1-12, wherein the NRPS contains 2-10 EUs.

14. The method of any one of claims 1-12, wherein the NRPS contains 11-100 EUs.

15. The method of claim 8, wherein said bacterium is *Bacillus subtilis*, *Pseudomonas syringae, Streptomyces* sp., or *Escherichia coli.* and wherein said fungi is a yeast cell.

16. The method of any one of claims 1-14, for the identification and production of peptides with activity as antibiotic, antifungal, antineoplastic agent, or immunosuppressant.

17. A kit composing genes encoding NRPS containing an assembly of EUs comprising
a) the following EU domains A, T, C or
b) an assembly of EUs containing modification domains as E, MT or Ox or other NRPS domains or
c) an assembly of EUs containing as first EU a C or
d) an assembly of EUs containing as last EU an A, T or TE or
e) an assembly of EUs containing instead of a C a Cy or C_{term} or
f) an assembly of EU domains containing EU domains from different species, wherein the adjacent C and A domains from different species must have the same or similar substrate specificity and
g) the borders between the EU domains are defined by the sequence Trp-Asn-Ala-Thr-Glu within the C-A linker,
for bioactive use.

18. A NRPS gene library produced by the kit of claim 17, said library comprising:
a) at least 15 EUs; or
b) at least 25 EUs; or
c) at least 50 EUs; or

d) at least 100 EUs,

encoding gene variants in each NRPS gene in the library.

19. A NRPS gene library of claim 18, wherein the library diversity has been increased by random mutagenesis.