

# OA for the Machines: the sci.AI Platform

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# Accessible Papers → Actionable Papers

by generating tons of  
detailed biomedical <METADATA>

```
1 <section resource="#sciai_2" typeof="Concept" vocab="http://ontology.sci.ai/ontology.updated.owl#">
2   <span property="name">tryptophan</span>
3   <span property="label">tryptophan</span>
4   <meta content="http://www.ebi.ac.uk/chebi/searchId.do?chebiId=CHEBI:27897" property="specificLink" />
5 </section>
6 <section resource="#sciai_r1" typeof="Statement">
7   <section property="subject" typeof="Subject">
8     <span property="text">Tryptophan hydroxylase</span>
9   </section>
10  <section property="predicate" typeof="Predicate">
11    <span property="text">adds</span>
12  </section>
13  <section property="object" typeof="Object">
14    <span property="text">hydroxyl group to the 5 position of tryptophan to form 5-hydroxytryptophan (5-HTP)</span>
15    <meta href="#" resource="#sciai_1" property="term" />
16    <meta href="#" resource="#sciai_2" property="term" />
17    <meta href="#" resource="#sciai_3" property="term" />
18  </section>
19
```



The diagram illustrates the relationship between the code and the text. A red box highlights the value 'CHEBI:27897' in the 'specificLink' attribute on line 4. A red arrow points from this box to the 'label' attribute on line 3, and another red arrow points from the box to the text 'hydroxyl group to the 5 position of tryptophan to form 5-hydroxytryptophan (5-HTP)' on line 14.

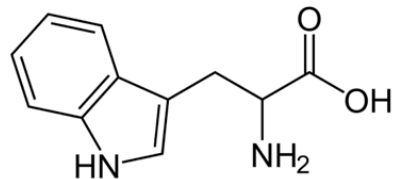
# Semanticization of Definitions and Relationships

## 1. Semantic Definition

" Tryptophan hydroxylase adds a hydroxyl group to the 5 position of tryptophan to form 5-hydroxytryptophan (5-HTP), which is subsequently decarboxylated to form 5-hydroxytryptamine (5-HT, or serotonin).

## 2. Semantic Relationship

[CHEBI:27897 - tryptophan](#)



An  $\alpha$ -amino acid that is alanine bearing an indol-3-yl substituent at position 3.

<Tryptophan hydroxylase>

|  
<adds>  
↓

<hydroxyl group to the 5 position of tryptophan to form 5-hydroxytryptophan (5-HTP)>

|  
<is>  
↓

<subsequently decarboxylated to form 5-hydroxytryptamine (5-HT, or serotonin)>

# sci.AI Exports Semanticized Paper in Standard Formats

**JATS** (W3C Compatible RDF/XML)

**HTML + RDFa**

**RDF**

**API**

# Happy Search Engines -> Higher Discoverability

Google Structured Data Testing Tool

Tryptophan

http://demo.sci.ai/tst/plos\_html.html

NEW TEST

```
18     <span property="relation" resource="#sciai_r1">
19       <a href="#" property="term"
resource="#sciai_1">Tryptophan hydroxylase</a> adds a
20       <a href="#" property="term"
resource="#sciai_2">hydroxyl group</a> to the 5 position of
21       <a href="#" property="term"
resource="#sciai_3">tryptophan</a> to form
22       <a href="#" property="term"
resource="#sciai_4">5-hydroxytryptophan</a> (
23       <a href="#" property="term"
resource="#sciai_4">5-HTP</a>), which is subsequently
decarboxylated to form
24       <a href="#" property="term"
resource="#sciai_5">5-hydroxytryptamine</a> (
25       <a href="#" property="term"
resource="#sciai_5">5-HT</a>, or
26       <a href="#" property="term"
resource="#sciai_5">serotonin</a>).
```

http://ontology.sci.ai/ontology.updated.owl#label	tryptophan
http://ontology.sci.ai/ontology.updated.owl#specificLink	https://meshb.nlm.nih.gov/record/ui?ui=D014364
http://ontology.sci.ai/ontology.updated.owl#specificLink	http://www.ebi.ac.uk/chebi/searchId.do?chebiId=CHEBI:27897
http://ontology.sci.ai/ontology.updated.owl#term	
@type	http://ontology.sci.ai/ontology.updated.owl#Concept
@id	http://demo.sci.ai/tst/plos_html.html#sciai_4

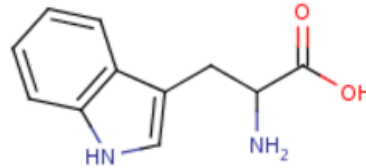
# Happy Readers → More Citations

“

*S. mediterranea* has in recent years emerged as a tractable model for studying regeneration and other processes, owing to a sequenced genome and the availability of tools such as whole-mount *in situ* hybridization and RNA interference. A recent regeneration screen of neural genes in *S. mediterranea* identified *tryptophan hydroxylase* (*tph*), which catalyzes the rate-limiting step in the synthesis of tryptophan. *tph* has previously been identified in the planarian nervous system. *tph* adds a hydroxyl group to the 5 position of tryptophan to form 5-hydroxytryptophan (5-HTP), which is subsequently decarboxylated to form 5-hydroxytryptamine (5-HT, or serotonin). After disrupting *tph* function in *S. mediterranea* by RNAi, we observed an unexpected phenotype: the planarians regenerate eyes that lack signs of a pigment cup.

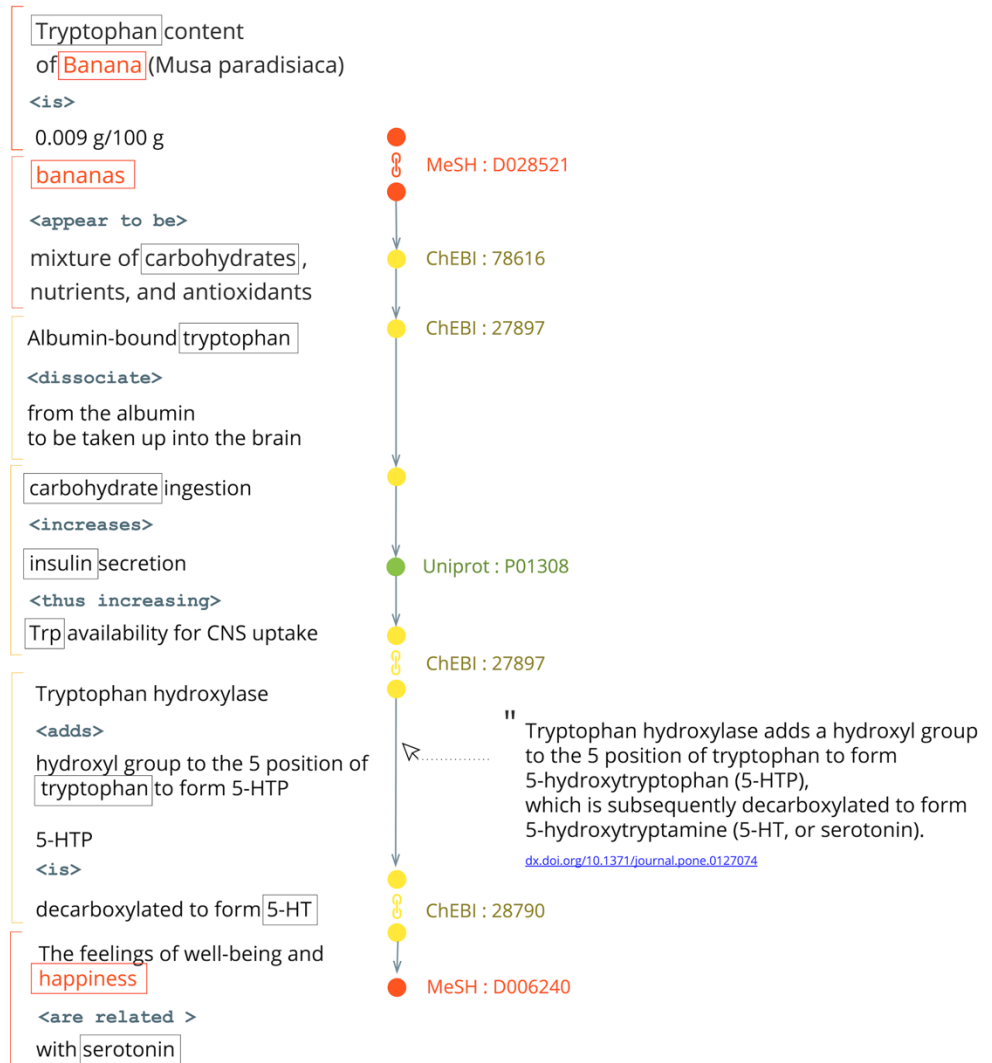
## ChEBI: tryptophan

An alpha-amino acid that is alanine bearing an indol-3-yl substituent at position 3.



# Happy Researchers → More Citations

Machine-Readable Papers are  
Ultimate Discovery Tools



# Next Steps : Embed sci.AI into Publishing Process

1. Publish each paper in machine-readable sci.AI JATS format next to the .pdf.
2. Publish paper in HTML with biomedical microdata.
3. Integrate sci.AI with electronic publishing platform.

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