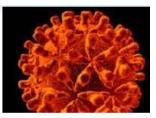
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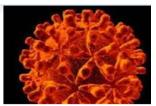
ISSN-2155-9929

Major Research Interests

Ding He (PhD) Department of Chemistry and Biochemistry Florida International University, USA University of Georgia, USA (current address)



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Major Research Interests

- 1. Transcriptomics and Bioinfomatics;
- 2. Using multi-techiniques for noval biomarker development, and the application of traditional biomarker for tracing natural or anthropogenic organic matter source;
- 3. Using GC-ir-MS analysis to measure specific isotopes (mainly ¹³C/¹²C and ²/¹H) of biomarkers to trace source.



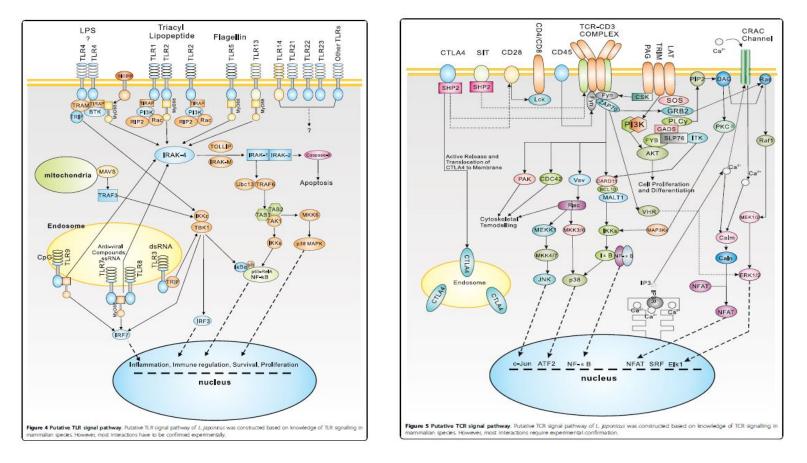
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1. Transcriptomics and Bioinfomatics

Putative TLR and TCR pathways of L. japonicus based on new 454 sequencing







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1. Transcriptomics and Bioinfomatics

Different expression analyses of stages and consensus sequences in *L. japonicus* under bacteria-challenge.

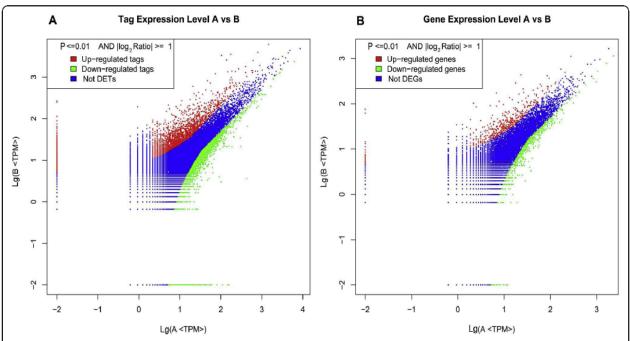
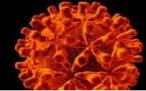
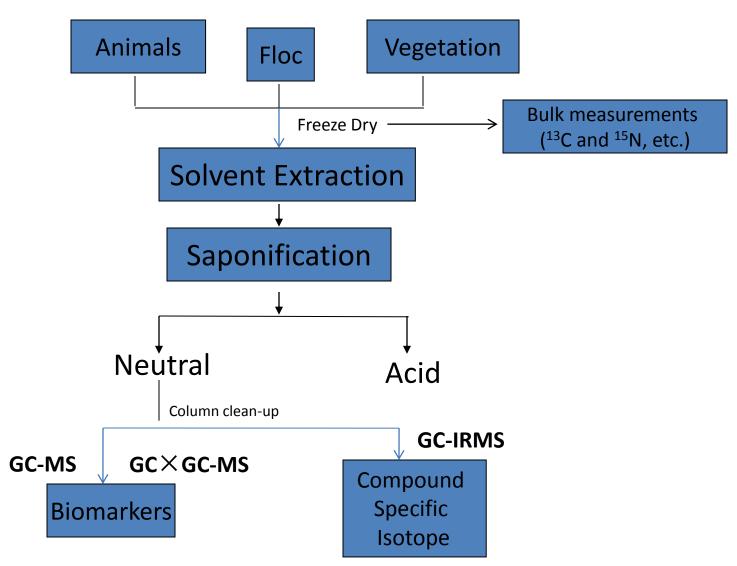


Figure 7 Differential expression analyses of tags and consensus sequences by DGE. The expression level for each tag and consensus was included in the volcano plot (Figures A and B, respectively). 'Not DETs' and 'Not DEGs' indicate 'not detected expression tags' and 'not detected expression genes', respectively. For Figures A and B, the x-axis contains Log_{10} of transcript per million of the bacteria-challenged group and the y-axis indicates Log_{10} of transcript per million of the mock-challenged group. Limitations are based on P < 0.01, and the absolute value of Log_2 (B/A) is greater than 1.





2. Biomarkers: Analytical Methods





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2. Common biomarkers to trace source

- -*n*-alkanes
- -fatty acid
- -Highly brached isoprenoid
- -hopanoid
- -sterol
- -PAHs
- -diterpenoid
- -triterpenoid

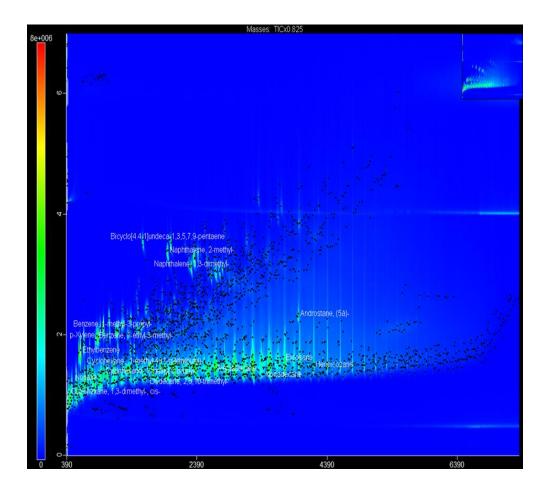




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2. Common biomarkers to trace source (examples)

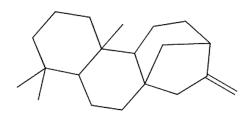
Raw data measured by GC×GC-TOFMS from a really complex mixture (crude oil for this case)

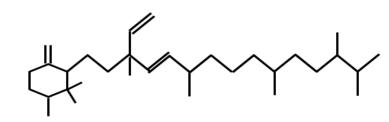




2. Common biomarkers to trace source

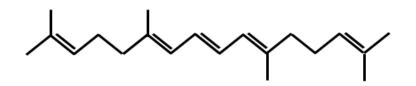
Example of an anteiso alkane: 3-methyloctacosane $(C_{29}$ branched alkane)





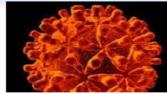
Example of a Botryococcene

ent-kaur-16-ene



2,6,11,15-tetramethyl-hexadeca-2,6,8,10,14-pentaene



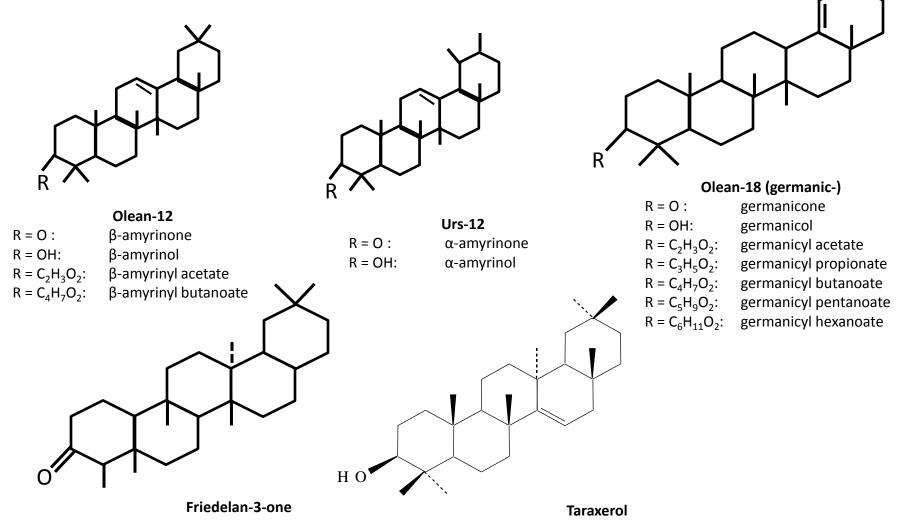


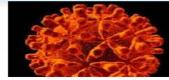
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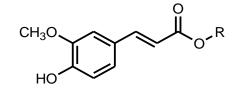
2. Common biomarkers to trace source





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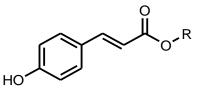
2. Biomarkers in Cattails (examples)



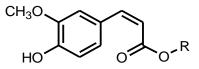
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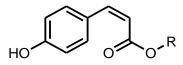
I. E-Ferulic acid, R=H Alkyl E-ferulates, R=(CH₂)_nCH₃, n=16-28



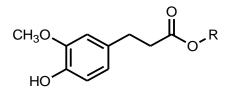
III. E-*p*-coumaric acid, R=H Alkyl E-*p*-coumarates, R as in I



II. Z-Ferulic acid, R=H Alkyl Z-ferulates, R as in I



IV. Z-p-coumaric acid, R=H Alkyl Z-p-coumarates, R as in I



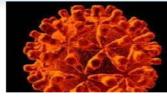
V. Alkyl dihydroferulates R=(CH₂)_nCH₃, n=20-24

Chemical structures of the ferulic and *p*-coumaric acids and esters.



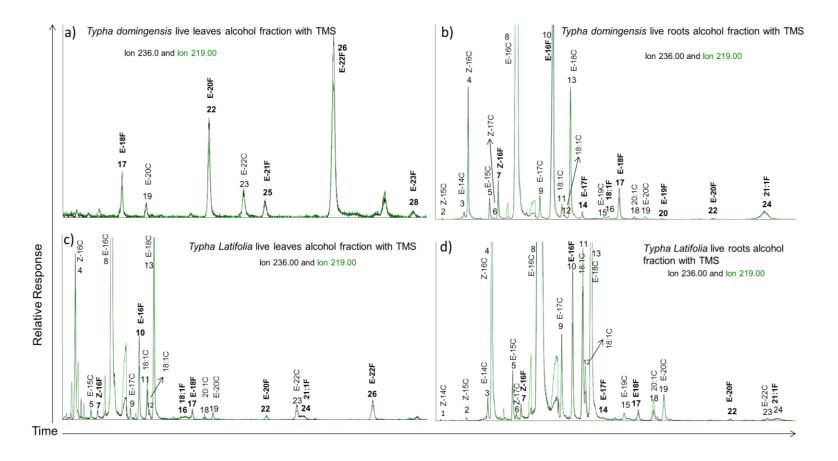
ISSN-2155-9929

Journal of Molecular Biomarkers & Diagnosis



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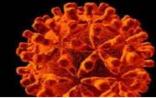
2. Biomarkers in Cattails (examples)



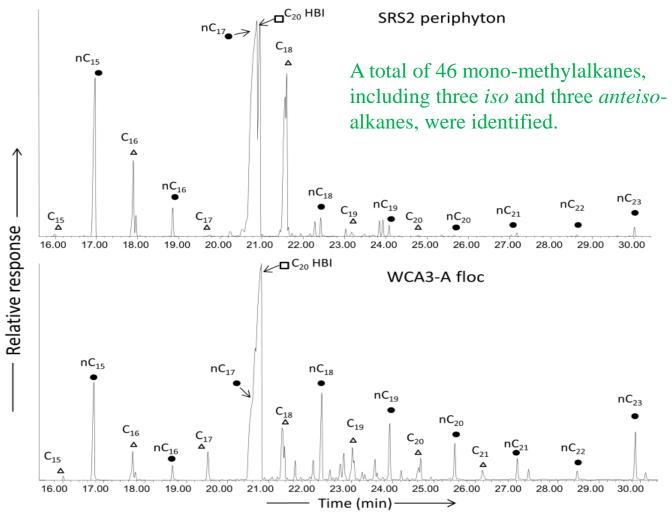
Note: Alkyl-p-coumarates and alkyl-ferulates were listed by elution order from no. 1 to 34. Alkyl-ferulates and alkyl-p-coumarates are marked by numbers, E-nF (n = number of alcohol moieties) means trans-n-alkyl-ferulate, E-nC (n = number of alcohol moieties) means trans-n-alkyl-ferulate.

He et al., 2014, submitted



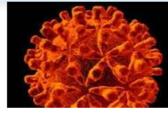


2. Biomarkers in periphyton and floc (examples)



13





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3. Compound specific isotopes for biomarkers

- Highly specialized instrumental technique used to ascertain the relative ratio of light stable isotopes of carbon (¹³C/¹²C), hydrogen (²H/¹H), nitrogen (¹⁵N/¹⁴N) or oxygen (¹⁸O/¹⁶0) in individual compounds separated from often complex mixtures of components.
- They can provide organic matter source information and direct information such as the primary productivity and hydrology etc.



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3. Examples of raw data generated from a GC-PirMS

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Molecular Biomarkers & Diagnosis Related Journals

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- Journal of Molecular and Genetic Medicine



