

uMelt QuartzSM User Guide

Created by Zachary Dwight

The screenshot shows the homepage of DNA-UTAH.ORG. At the top is a banner with the text "DNA-UTAH.ORG" and a map of Utah. Below the banner is a navigation bar with links: Home, Publications, About Us, About the Lab, Contact Us, and Utah. A search bar is located on the left side. The main content area is divided into several sections: "What we do" (listing High-Speed Melting, Extreme PCR, High-Resolution Melting, LightCycler PCR, and Rapid-cycle PCR), "Top Software" (listing uMelt, uAnalyze, uVariants, T_m Tool, and Digital PCR), "Resources" (listing Publication Database, Lectures, Posters, Dye Database, Genetic Code Map, and PCR Animations), "Welcome!" (a general introduction to the portal), "Software" (a list of featured software tools with update status), and "Extreme PCR" (a section describing the technology and including an image of a gel electrophoresis result).

DNA-UTAH.ORG

Home Publications About Us About the Lab Contact Us Utah

Search this site

What we do

- High-Speed Melting
- Extreme PCR
- High-Resolution Melting
- LightCycler PCR
- Rapid-cycle PCR

Top Software

- uMeltSM
- uAnalyzeSM
- uVariantsSM
- T_m Tool
- Digital PCR

Resources

- Publication Database
- Lectures
- Posters
- Dye Database
- Genetic Code Map
- PCR Animations

Welcome!

This portal delivers digital content exploring simple and rapid methods for nucleic acid analyses, with goals to provide better ways to expedite research and perform clinical diagnostic tests. For nearly three decades, the Wittwer Lab for DNA Analysis developed many innovative technologies now commonly used in research and clinical applications.

Software

Through our new digital site (formerly dna.utah.edu), we will continue to provide accessible, high-quality and easy to use software that is free of registration and cost. We hope to provide our expertise, to the best of our ability, in software form to help all those that seek it.

Featured Design Analysis BioCalculators References

uMelt : Melting Curve Prediction

T_m Tool : Melting Temperature Prediction Software **Updated!**

uVariants : SNP Information & Sequence Context App **New Features!**

uAnalyze v2.0 : Melting Normalization and Analysis Tool **Updated!**

PrimerSPY : Template Driven Small Amplicon Primer Design **BETA!**

MeltPubs: Publications Database Related to Melt Curve Analysis

External Software Links : Useful tools and sites for Assay Development **Updated!**

Extreme PCR

PCR is a key technology in molecular diagnostics with an ability to amplify and quantify specific DNA fragments in less than an hour. Recently developed, [Extreme PCR](#) can be accomplished in 15-60 seconds and was developed while investigating the kinetic limits of PCR.

[Learn More at Clinical Chemistry](#)

PCR Time (s)

11.2 14.7 18.2 21.7

75 bp
50 bp
25 bp

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About uMelt Quartz

Address:

`dna-utah.org/umelt/quartz`

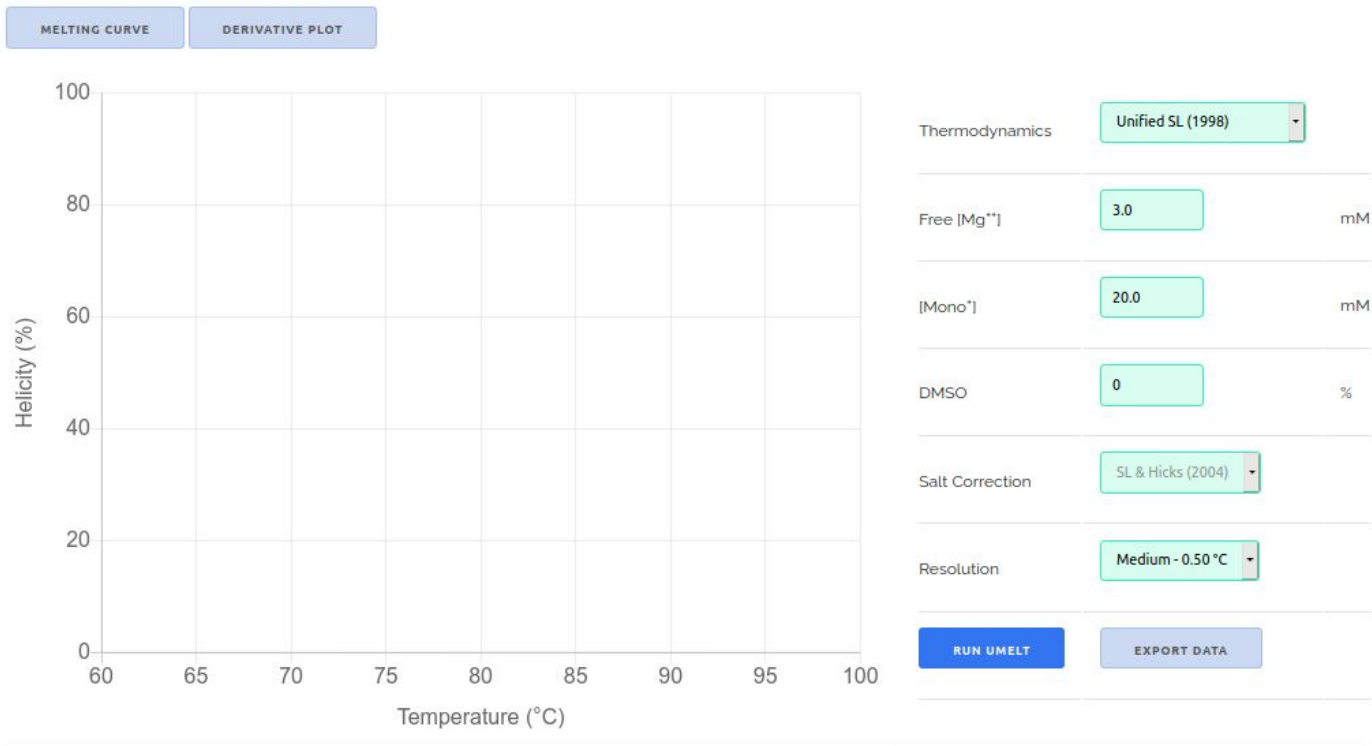
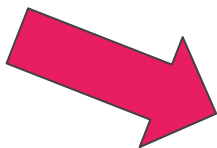
Publication:

`https://academic.oup.com/bioinformatics/article/27/7/1019/232651`

GUI

Much like the original Flash version of uMelt, defaults are in and already selected.

Copy and paste your sequence into the box below:

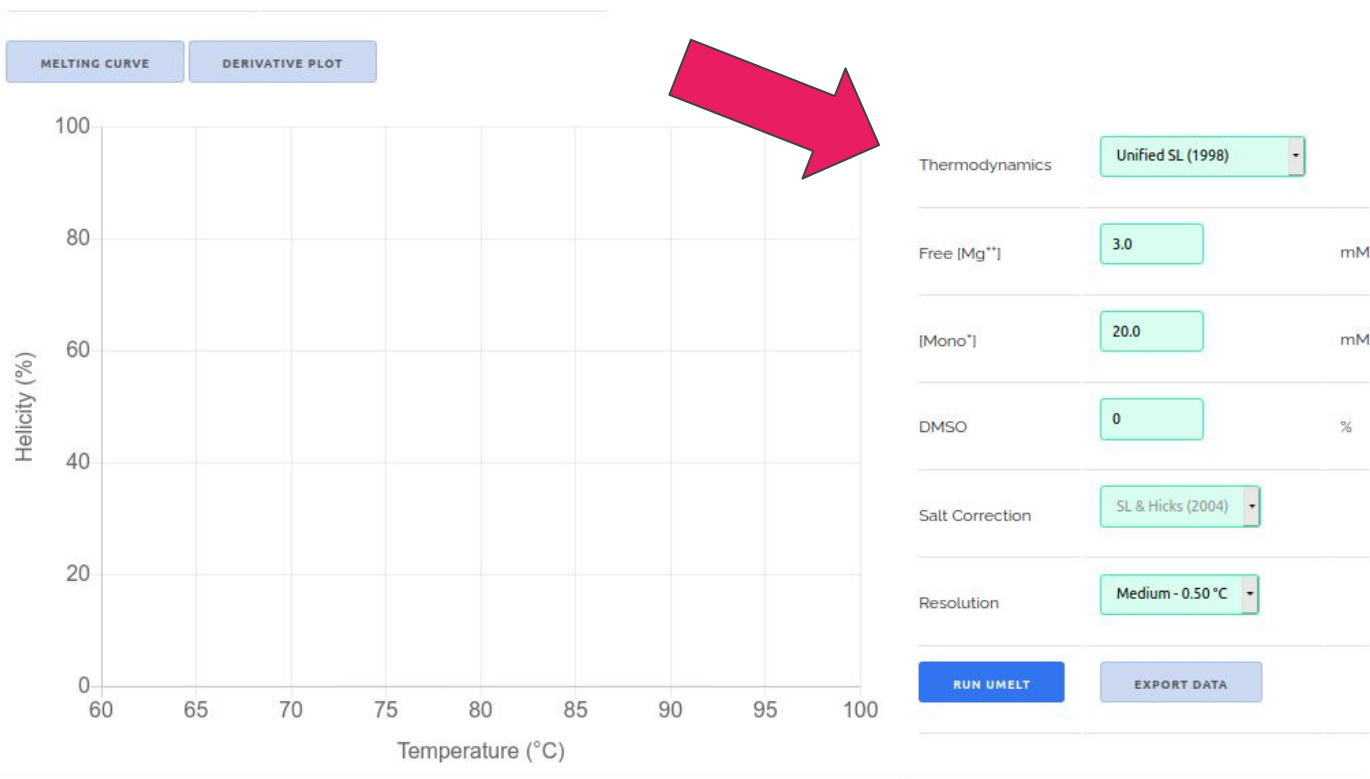


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCCCAACACATTCAACCTCTGCCACC  
ATGGGGAAC TGGGCTGTGAATGAGGGGCTCTCCATTTTTGTTCATTGTAAGTACCAACAAGAGATAAGT
```

Parameters

Match parameters to those closest to your laboratory or PCR conditions to obtain a more accurate melting prediction:

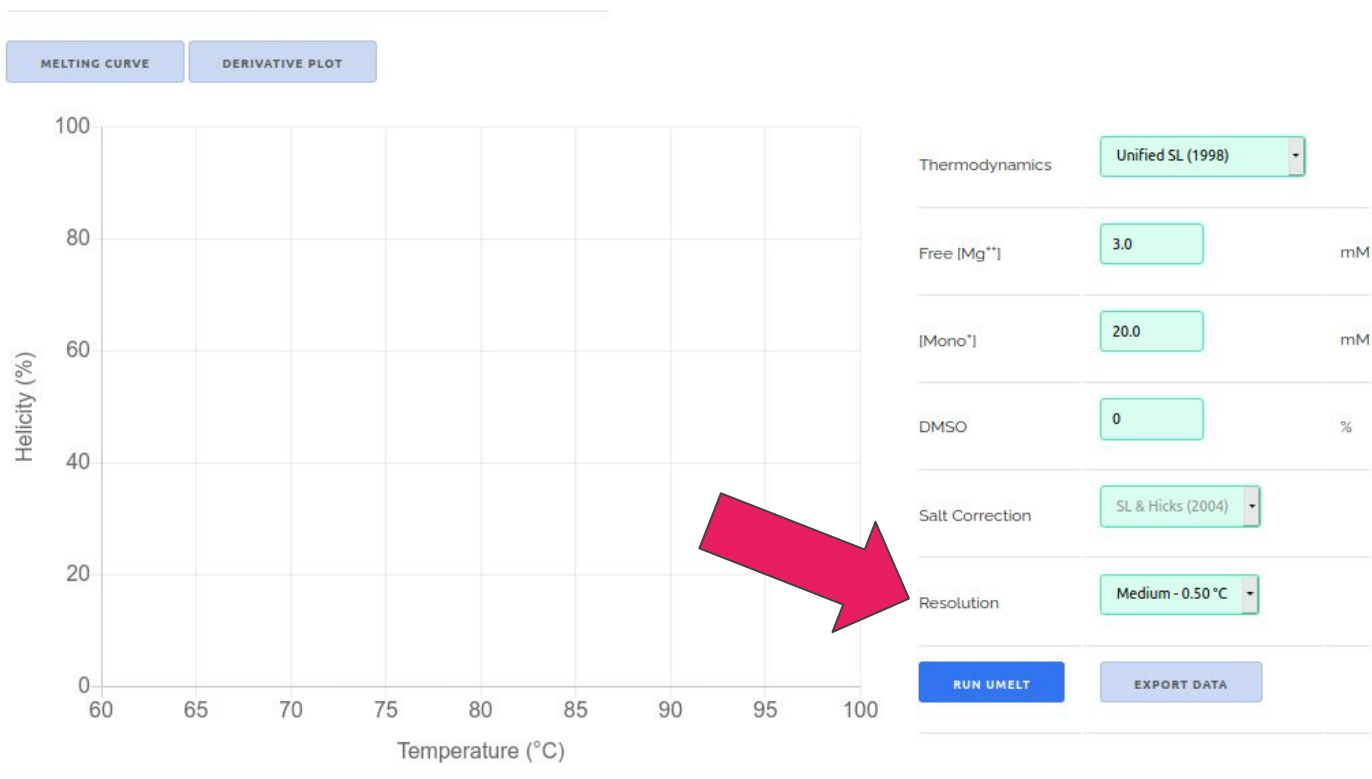


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCCCAACACATTCAACCTCTGCCACC  
ATGGGGAACCTGGGCTGTGAATGAGGGGCTCTCCATTTTTGTCAATTGTAAGTACCAACAAGAGATAAGT
```

Resolution

The density of predicted points can be adjusted. More points provides smoother curves but calculation time takes longer:

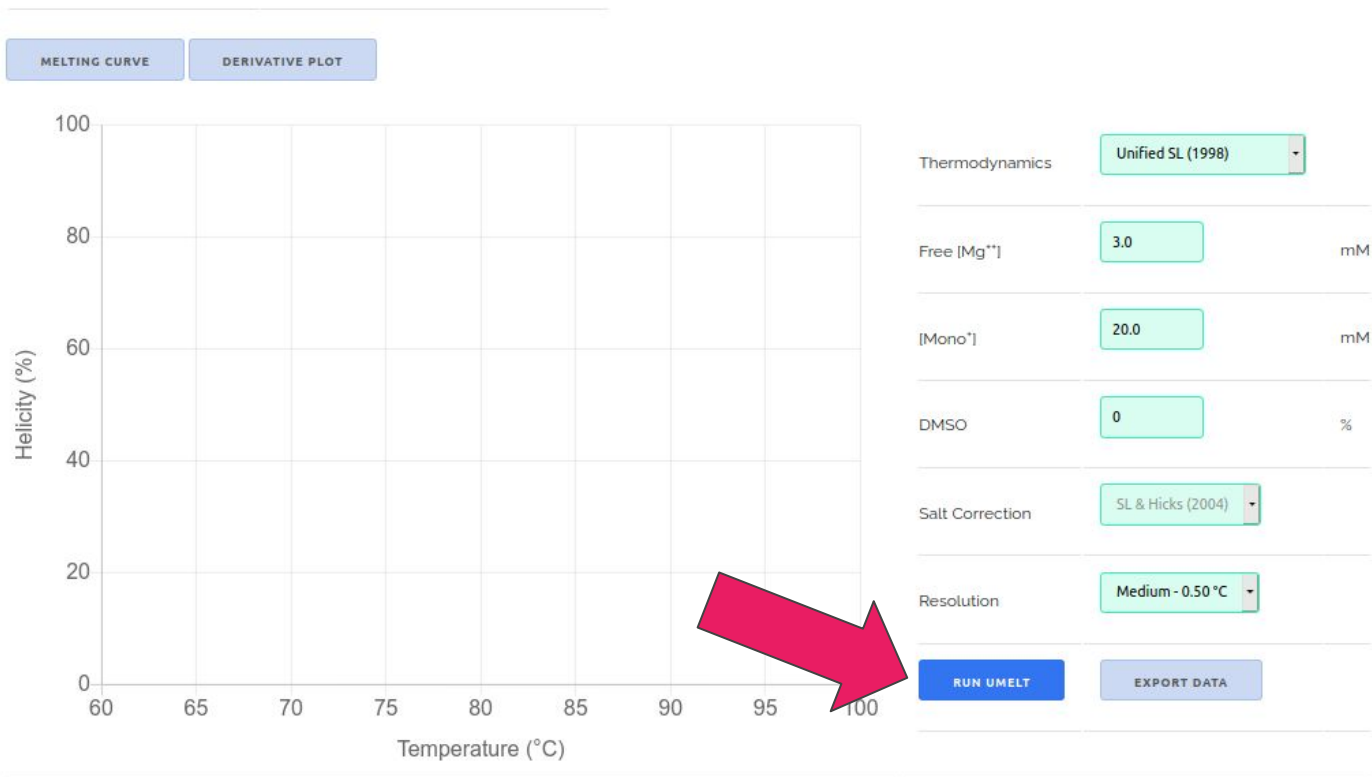


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCGCCAACACATTCAACCTCTGCCACC  
ATGGGGAACCTGGGCTGTGAATGAGGGGCTCTCCATTTTTGTTCATTGTAAGTACCAACAAGAGATAAGT
```

Run!

When all the inputs and parameters are set - click the 'Run uMelt' button:

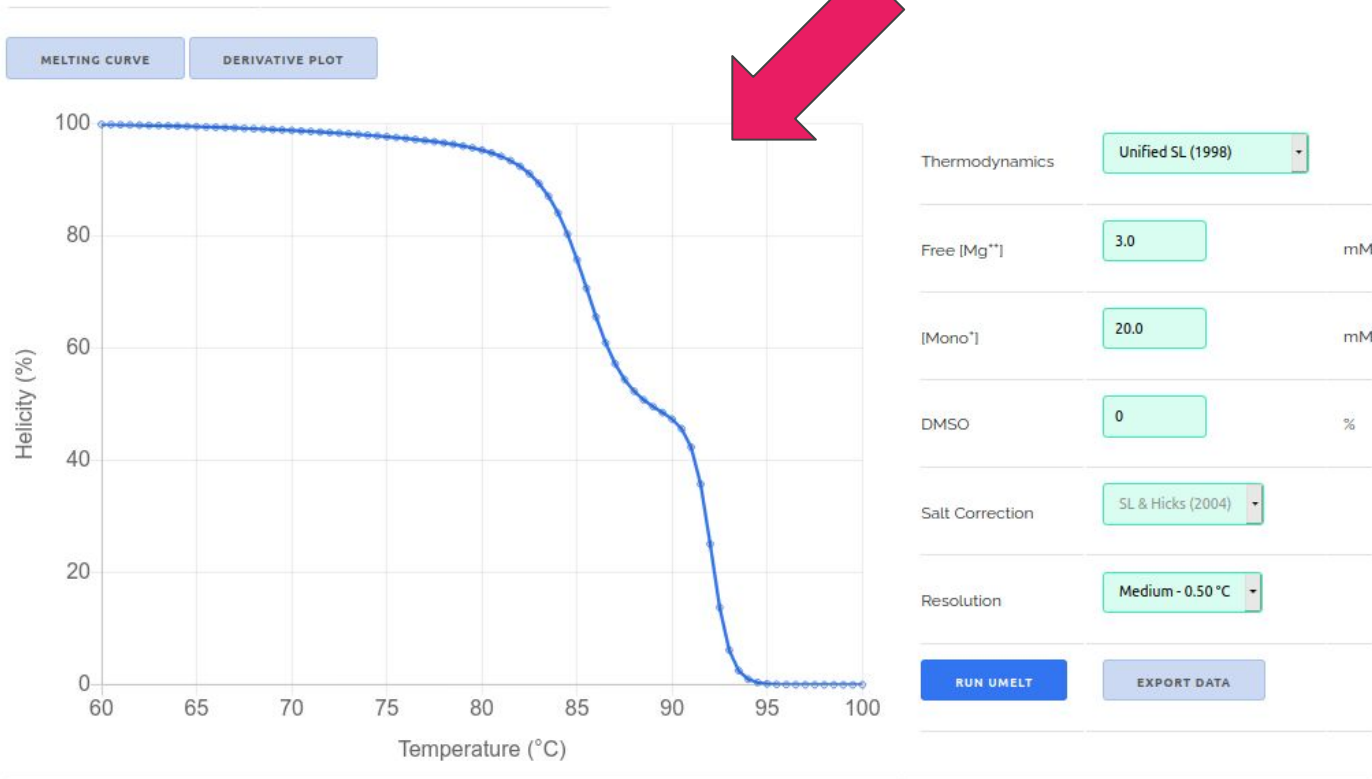


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCGCCAACACATTCAACCTCTGCCACC  
ATGGGGAAC TGGGCTGTGAATGAGGGGCTCTCCATTTTTGTTCATTGTAAGTACCAACAAGAGATAAGT
```

Melt Curve

— — —
A melting curve is graphed upon calculation completion:

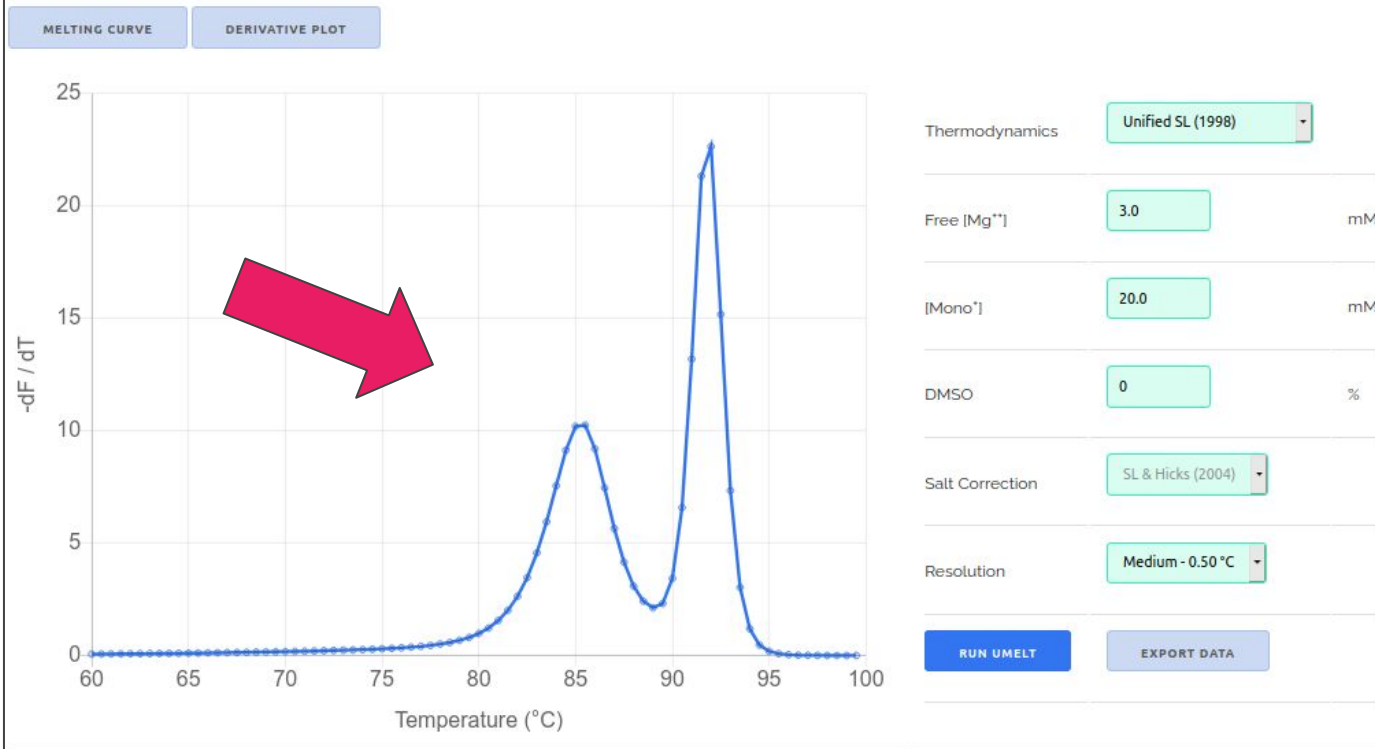


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTA AAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGGGCGGCCAACACATTCAACCTCTGCCACC  
ATGGGGAAC TGGGCTGTGAATGAGGGGCTCTCCATTTTGTTCATTGTAAGTACCAACAAGAGATAAGT
```

Derivative Plot

— — —
A melting derivative plot is also available:

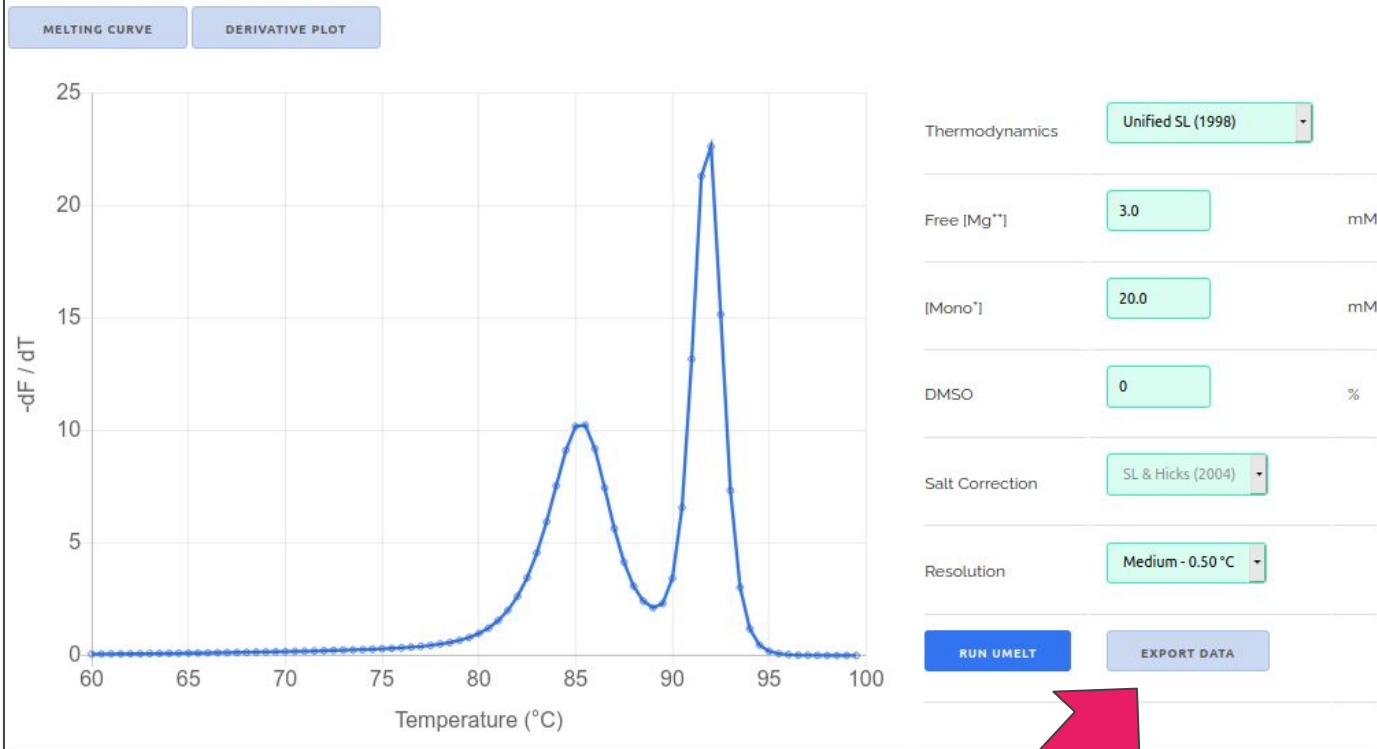


Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCCCAACATTCAACCTCTGCCACC  
ATGGGGAACCTGGGCTGTGAATGAGGGGCTCTCCATTTTGTCAATTGTAAGTACCAACAAGAGATAAGT
```


Data Export

Use the 'Export Data' button to download all the graph outputs (melting and derivative) to .csv file:



Sequence >> GC Content = 47%, Length = 189 bp

```
ACGACGTTGTAAACGACAGAAGCATAGTATAGAAGAAAAACAGCGCGCGGGCCCAACATTCAACCTTGCCACC  
ATGGGGAACCTGGGCTGTGAATGAGGGGCTCTCCATTTTGTCAATTGTAAGTACCAACAAGATAAGT
```



Thanks!

Questions, comments, feedback:

zach.dwight@path.utah.edu

Our site:

dna-utah.org

