**Molecular ions for the**
**Interactions of T7 DNA Polymerase with DNA Substrates Studied by Chemical Modification Coupled Tandem Mass Spectrometry**

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**OVERVIEW**

**DISCUSSION**

**Purpose**

Most of tyrosine and histidine that were iodinated are exposed on the surface of T7 polymerase.

**Peptide Identification**

A peptide identification was formed by incubating the T7 polymerase with an excess of a primer-template DNA bound to DNA. Tyr530 is exposed to solvent in both DNA bound and DNA-free T7 polymerase.

**RESULTS**

**Peptide Identification**

Tryptic peptides from both the uniodinated and iodinated protein were detected.

**Scheme Showing Experimental Design**

**INTRODUCTION**

A major photoproduction is the dideoxyadenosine (dATP) at stop residues. The consequence of the photoproduct is arrest of chain elongation, which is halted by T7 polymerase in the presence of ddNTP. The polymerase forms a ternary complex of polymerase-DNAdNTP. The 117 tyrosines of T7 polymerase are expected to be involved in the process of photorepair because of the closed conformation, however, as in bacteria but not as a result of a conformational change in the protein complex and determined sites of iodination by using tryptic digestion and MS/MS.

**Scheme Showing Experimental Design**

**METHODS**

**RESULTS**

**CONCLUSIONS**

Most of tyrosine and histidine that were iodinated are exposed on the surface of T7 polymerase.

**METHODS**

**DISCUSSION**

**CONCLUSIONS**

**Acknowledgements**

**References**


**Figure Legend**

**Figure Legend**

**Table 1: Observed isolated peptides observed for T7 polymerase with and without DNA**

<table>
<thead>
<tr>
<th>Observed Isolated Peptide (m/z)</th>
<th>T7</th>
<th>T7-DNA1-4dNTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1I(Di-I)</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>D1I(Di-I)</td>
<td>74</td>
<td>74</td>
</tr>
</tbody>
</table>

**Table 2: Quantification of isolated peptides (both mono- and di-iodinated) for reaction of protein with and without DNA**

<table>
<thead>
<tr>
<th>Observed Isolated Peptide (%)</th>
<th>Modified Peptide (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T7</td>
<td>T7-DNA1-4dNTP</td>
</tr>
<tr>
<td>L1S(T1+2), L1S(T3+4), L1S(T5+6), L1S(T7+8)</td>
<td>65</td>
</tr>
<tr>
<td>L1S(T2+3), L1S(T4+5), L1S(T6+7), L1S(T8+9)</td>
<td>74</td>
</tr>
<tr>
<td>L2S(T1+2+3+4), L2S(T5+6+7+8)</td>
<td>55</td>
</tr>
<tr>
<td>L2S(T2+3+4+5), L2S(T6+7+8+9)</td>
<td>74</td>
</tr>
</tbody>
</table>

**References**