Use this form to assist you to complete risk assessments for hazardous activities and processes. Any serious or ongoing hazards should be reported via RiskWare to ensure that appropriate corrective actions are tracked and completed.

<table>
<thead>
<tr>
<th>Faculty/School:</th>
<th>Faculty of Science / School of Molecular Bioscience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Assessment Reference Number:</td>
<td>SMB019</td>
</tr>
<tr>
<td>Risk Assessment Name:</td>
<td>High pressure liquid chromatography (HPLC)</td>
</tr>
<tr>
<td>Prepared by:</td>
<td>Kamrul Zaman</td>
</tr>
<tr>
<td>Responsible supervisor/s:</td>
<td>Markus Hofer (Chair WHS committee) &amp; Dianne Fisher (Safety Officer)</td>
</tr>
</tbody>
</table>

**Identify the activity and the location**

<table>
<thead>
<tr>
<th>Activity or process:</th>
<th>HPLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Room: 411, Building G08; and other locations in G08.</td>
</tr>
</tbody>
</table>

**Identify who may be at risk**

- This may include fellow workers, students, visitors, contractors and the public

**Persons at risk:**

- All staff and students at SMB that do HPLC

**Risk assessment team (Who was consulted?):**

- Custodian of HPLC
- WHS committee at SMB

**List of Legislation, Code of Practice, Australian Standards, Guidance Materials used to determine control measures**

Please see the Safe Work Procedure (SWP) Code no. SMB019

**Risk Assessment Methodology**

Assessing the risk is a brainstorming exercise, which is most effectively carried out in a team environment with the people required to complete the activity or process. Most activities or processes are broken down into a variety of separate tasks. For each task, consider the hazards, the potential harm or negative outcomes and the conditions required for those negative outcomes to occur.

Whenever assessing the health and safety risks associated with a task, always consider the following primary risk factors:

- The **physical activities** required to complete the task e.g. repetitive movement, high force, physical exertion, awkward posture
- The **work environment** e.g. lighting, work layout, traffic, thermal comfort, working in isolation
- The **nature of the hazard itself** e.g. working with chemicals, microorganisms, radiation, machinery, potentially violent clients
- The **individual workers involved**, e.g. level of training, skills, experience, health, age, physical capacity

The information gathered from the **risk assessment** process must be used to develop a **Safe Work Procedure (SWP)**.
<table>
<thead>
<tr>
<th>Task or scenario</th>
<th>Hazard/s</th>
<th>Associated harm, e.g. what could go wrong?</th>
<th>Existing Risk Controls</th>
<th>Current risk rating</th>
<th>Any additional controls are required?</th>
<th>Residual risk rating</th>
</tr>
</thead>
</table>
| Solvent used as mobile phase (eg. Methanol, Acetonitrile, Hexane etc.) | Toxic, Flammable | - Vapour inhalation  
- Solvent can come into skin contact  
- Solvent might splash on face or other parts of body from connecting tubings. | - Always wear safety glass, gloves, lab gown and musk  
- Prepare solvent in fume hood.  
- Do not breath the fumes of solvent  
- Use 3M musk while using 100% Acetonitrile  
- Collect all Ensure solvent reservoir and waste container caps are gas-tight  
- Leave door and windows open for well ventilation | LOW L6 x Possible | - Follow those analytical protocols that require very low concentration of organic solvent or do not require organic solvents at all, whenever possible. | LOW L6 x unlikely |
| Flowing liquids in HPLC are under high pressure | - Capillaries can come off from the connector  
- Leakage of capillary & connection  
- Electrocution or fire | - Can cause eye injury and splash chemicals on face  
- Solvent can come into skin contact  
- Due to high pressure capillaries might come off from the connection and overflow solvent/mobile phase on bench, under HPLC and power connection. | - Use PPE (Gown, gloves, safety glasses) while working with HPLC  
- Leave the purge valve open while turning on the HPLC  
- Keep eyes on pump pressure, make sure it is well below to maximum limit  
- Use both side pre-swaged capillary tubes to connect column  
- Change frit routinely  
- Set up pump with low flow rate (0.5 ml/min) and gradually increase flow rate  
- Keep power connection and all electric connection away from the HPLC pump.  
- Routinely serviced by qualified | LOW L6 x unlikely | N/A | - |

1 Always consider whether or not it is possible to eliminated the hazard or hazardous task altogether. If this is not possible, refer to the [hierarchy of risk controls](#).
### Analysing Samples

- **Toxic**
- **Biohazard** (e.g. Pathogenic microbes, clinical samples, GMO etc.)
- **Samples dissolved in organic solvents**

- Pollutants, metabolic inhibitors etc can be harmful
- Pathogenic microbes and clinical samples has the potential to cause disease
- Organic solvent can be breathed in if not handled and disposed correctly

- Use appropriate PPE (Gloves, Safety glasses, lab gown, close shoes etc.)
- Handle samples carefully and placed them correctly in auto injector
- Dispose sample vials in sharp containers.
- Injected samples with mobile phase will be collected in HPLC waste containers.

<table>
<thead>
<tr>
<th>RISK</th>
<th>Likelihood</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>L6 x unlikely</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Solvent and samples spills

- **Toxic**
- **Flammable**
- **Biohazards**

- Vapour inhalation, can come with skin contact
- Can cause fire
- Can cause infection

- In case of organic solvent follow SDS of that solvent
- Use appropriate PPE
- Use spill kit to clean the area
- In case of biological sample use biological spill kit and dispose in biohazard bag

<table>
<thead>
<tr>
<th>RISK</th>
<th>Likelihood</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>L6 x unlikely</td>
<td>N/A</td>
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</tbody>
</table>
## Implementation of Additional Risk Controls

<table>
<thead>
<tr>
<th>Additional controls needed</th>
<th>Resources required</th>
<th>Responsible person</th>
<th>Date of implementation</th>
<th>RiskWare Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe Work Procedure (SWP)</td>
<td>DONE</td>
<td>WHS committee</td>
<td>1.7.14</td>
<td>N/A</td>
</tr>
<tr>
<td>Train workers to complete process in accordance with SWP</td>
<td>Time – custodian of equipment and worker</td>
<td>Supervisor</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>University and local WHS training</td>
<td>Time</td>
<td>Supervisor</td>
<td>N/A</td>
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</tbody>
</table>

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### List emergency controls for how to deal with fires, spills or exposure to hazardous substances and/or emergency shutdown procedures

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### REVIEW

<table>
<thead>
<tr>
<th>Scheduled review date</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
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</thead>
<tbody>
<tr>
<td>Are control measures in place (YES/NO)</td>
<td></td>
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<tr>
<td>Are controls eliminating or minimizing the risk (YES/NO)</td>
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<tr>
<td>Are there any new problems with the risk (YES/NO)</td>
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<tr>
<td>Reviewed by:</td>
<td></td>
<td></td>
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<tr>
<td>Actual Review date:</td>
<td></td>
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</tbody>
</table>
### Risk Matrix

<table>
<thead>
<tr>
<th>Potential Consequences</th>
<th>L6</th>
<th>L5</th>
<th>L4</th>
<th>L3</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor injuries or discomfort. No medical treatment or measureable physical effects.</td>
<td></td>
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<tr>
<td>Injuries or illness requiring medical treatment. Temporary impairment.</td>
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<tr>
<td>Injuries or illness requiring hospital admission.</td>
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<td>Injury or illness resulting in permanent impairment.</td>
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<td>Fatality</td>
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<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Not Significant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Severe</th>
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</thead>
<tbody>
<tr>
<td>Expected to occur regularly under normal circumstances</td>
<td>Almost Certain</td>
<td>Medium</td>
<td>High</td>
<td>Very High</td>
<td>Very High</td>
</tr>
<tr>
<td>Expected to occur at some time</td>
<td>Likely</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Very High</td>
</tr>
<tr>
<td>May occur at some time</td>
<td>Possible</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Not likely to occur in normal circumstances</td>
<td>Unlikely</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
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<tr>
<td>Could happen, but probably never will</td>
<td>Rare</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
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</tbody>
</table>
In signing this section the assessor agrees that the following persons are competent in following this Risk Assessment.

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date Competent</th>
<th>Name Assessor/Authoriser</th>
<th>Assessor/Authoriser signature</th>
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