



**Interactive Online  
SPE-LC-MS course on DVD,  
and standard LC-MS courses.**

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# Products: Symbiosis learning centre

- Interactive education tool for Symbiosis users
- Release date: 1 November 2004
- 2 CD ROMs







# Symbiosis learning centre

- **Why?**

- ♣ Prospekt-2 systems not used after first assays
- ♣ Feedback from customers: more information/training
- ♣ As a solutions provider we feel that training/support is a requirement to be successful (for customer and Spark)

- **Goals**

- ♣ Offer customers a training tool based upon simplicity
- ♣ Maintain skills of Symbiosis operator
- ♣ Management tool
- ♣ Usage whenever the customer wants to
- ♣ Not only XLC with Symbiosis but also SPE and LC-MS

# Definition of training tool

- Multimedia tools:
  - ♣ Text & pictures/photos
  - ♣ Animations
  - ♣ Voice over
- Subjects to be studied:
  - ♣ SPE
  - ♣ Symbiosis
  - ♣ SparkLink operation software
  - ♣ Method development
  - ♣ LC-MS
- Web-based Assessment
- Management report



# Introduction screen

The screenshot shows a web browser window displaying the Symbiosis Learning Centre introduction page. The browser's address bar shows the URL <http://www.spark.nl>. The page content includes a navigation menu on the left, a main text area, and a photograph of a laboratory workstation. Red annotations highlight the navigation menu, the browser address bar, and a close button in the top right corner. A red box labeled "Navigation tools" is positioned over the left-hand menu.

**Navigation tools**

## 1.1 Symbiosis Learning Centre

Welcome to the Symbiosis Learning Centre.

The learning materials within this product are designed to give you the opportunity to fully explore and understand the concepts of XLC-MS technology.

You now have access to a wide range of information ranging from the basic principles for solid phase extraction to the in-depth study of the how to use Symbiosis to easily and efficiently perform advanced analyses.

Our goal is that you will be enabled to very quickly improve the workflow within your laboratory to unsurpassed levels using Symbiosis instrumentation – the simple and effective solution for performing automated XLC-MS analysis.

By completing the assessments within this program you can become a Certified Symbiosis User, demonstrating your ability to fully understand the concept and working principles of Symbiosis.

I'm sure that you will find the information in the Symbiosis Learning Centre very useful, we at Spark Holland hope that you gain a insight into how effective XLC-MS technology can be in speeding up your laboratory throughput.

Enjoy your Symbiosis learning experience.

Rob Casteln  
CEO Spark Holland BV

**Spark**

# Global section

- Automation challenges
- Introduction of Symbiosis

1.1 Symbiosis Learning Centre  
1.2 The Automation Challenge  
1.2.1 LCMS Timeline  
1.2.2 Sample Processing Options  
1.2.3 Time Allocation  
1.2.4 Bottlenecks  
1.2.5 Future Possibilities  
1.3 Symbiosis  
1.3.1 Why is VSCMS - how can  
1.3.2 Maximize Automation  
1.3.3 Integrating Techniques  
1.3.4 Speed via LCMS Parallel  
1.3.5 Flexibility through Generic  
1.3.6 Matrix Removal via LCMS  
1.3.7 Single isocratic Method  
1.3.8 Fit for the Future  
Assessment

1.3 Symbiosis  
1.3.2 Symbiosis – Maximum Automation

**Symbiosis Pharma System**

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# SPE section

- Molecular properties
- SPE protocols
- Getting started
- HySphere
- Online SPE compared to other sample prep techniques

**2.1 Molecular Properties**  
**2.1.4 Functional Group Interactions**

Once the functional groups on a molecule have been assessed, it is possible to draw some properties of the molecule relevant to the sample preparation process. These properties are group interactions.

The term "functional group interactions" speaks of the manner in which one functional group interacts with the functional groups in the surrounding environment, in particular in the sample preparation context.

Each primary functional group category exhibits its own respective and unique functional reactivity of the interactions with the surrounding environment that allows the sample preparation of the categories of interactions to be isolated in a different manner. To gain a deep understanding of these interactions, it is important to obtain a clear picture of these categories of interactions.

Another important consideration regarding solubility of an analyte species (i.e., interaction) is that the overall solubility characteristics are a composite of the individual functional groups. In SPE, by contrast, any individual functional group interaction with the solvent may dominate other functional groups.

**Dominant Interaction**

The diagram shows a molecule with various functional groups (red and blue spheres) interacting with a surrounding environment (represented by a grid). A box labeled "Dominant Interaction" highlights a specific interaction between a red sphere and a blue sphere.

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**2.2 Modes of SPE**  
**2.2.1 Non-Polar SPE**

Non-polar SPE is the extraction process where molecules with non-polar functional groups are extracted from predominantly polar buffered OAC solvents involving low-polar surface properties.

In non-polar SPE, the retention mechanism is the interaction of non-polar groups on the analyte of interest and the non-polar functional groups on the surface, via Van der Waals forces. This interaction is disrupted (allowing elution of the analyte) by solvents with significant non-polar character. This interaction is facilitated (allowing retention of the analyte) by solvents having very little non-polar character or, in other words, very polar solvents.

While water is the most polar solvent of all, non-polar SPE is an ideal technique for the extraction of aqueous samples. Most non-polar analytical samples encountered in bioanalysis are aqueous, non-polar SPE is widely used.

Examples of common solvents used in non-polar SPE include C18, C8, C6, C4, C2, phenyl, cyclohexyl, and propylsils. These surface chemistries are most often bonded to a base of silicic acid. In addition, many commercial polymers also exist that are fundamentally non-polar in nature.

The diagram shows a surface with various functional groups attached to a base of silicic acid. The groups are labeled: C18, C8, C6, C4, C2, Phenyl, Cyclohexyl, and Cyanopropyl. The surface is represented by a grid.

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# SparkLink section

- System configuration
- Direct control
- Editing methods
- Making Batches
- Import/Export features

The left screenshot displays the '4.0.1. Pre-delivered System' configuration window. It features a sidebar with a tree view of system components and a main area showing a flow diagram with four stages: 'PC-CON', 'ANALYZER', 'ANALYZER', and 'ANALYZER'. The right screenshot shows the '4.7.2. Exporting Run Tables to Analyst Software' window, which contains a table with columns for 'No.', 'No. of samples', 'Left Sample Count', 'Right Sample Count', 'Process at year', 'Preparation Method', and 'Data File'. The table lists 20 rows of data, including sample numbers (e.g., 101, 102, 103) and their corresponding data file paths (e.g., 'C:\data\spk\_001\_FuelFit\_Fuel.dia').

| No. | No. of samples | Left Sample Count | Right Sample Count | Process at year | Preparation Method               | Data File                   |
|-----|----------------|-------------------|--------------------|-----------------|----------------------------------|-----------------------------|
| 101 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 1 ppm.vill      |
| 102 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 2 ppm.vill      |
| 103 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 4 ppm.vill      |
| 104 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 8 ppm.vill      |
| 105 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 16 ppm.vill     |
| 106 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 32 ppm.vill     |
| 107 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 64 ppm.vill     |
| 108 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 128 ppm.vill    |
| 109 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 256 ppm.vill    |
| 110 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 512 ppm.vill    |
| 111 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 1024 ppm.vill   |
| 112 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 2048 ppm.vill   |
| 113 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 4096 ppm.vill   |
| 114 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 8192 ppm.vill   |
| 115 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 16384 ppm.vill  |
| 116 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 32768 ppm.vill  |
| 117 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 65536 ppm.vill  |
| 118 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 131072 ppm.vill |
| 119 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 262144 ppm.vill |
| 120 |                |                   |                    |                 | C:\data\spk_001_FuelFit_Fuel.dia | LC gradient 524288 ppm.vill |

# Method Development section

- Advanced Method Development
- Animation per SPE step
- SparkLink software AMD tutorial

The image displays two overlapping screenshots of the SparkLink software interface. The left screenshot shows a 'Method Development Process' window with a tree view on the left and a central diagram. The diagram illustrates the process flow for 'XLC Method Development', starting with 'All components' (Generic Method) and 'Few components' (Sorbent Screening Method) leading to a 'HySphere™ GP cartridge' and 'Generic Protocol'. 'Complex components' (Advanced Method Development) also feed into the process. The right screenshot shows a 'Hardware' window with a schematic diagram of the extraction and breakthrough assessment setup. The schematic includes a pump, a column, and a detector, with labels for 'Waste' and 'TO Column'. The software interface includes a menu bar with 'Method Development' and 'Hardware' options, and a status bar at the bottom.



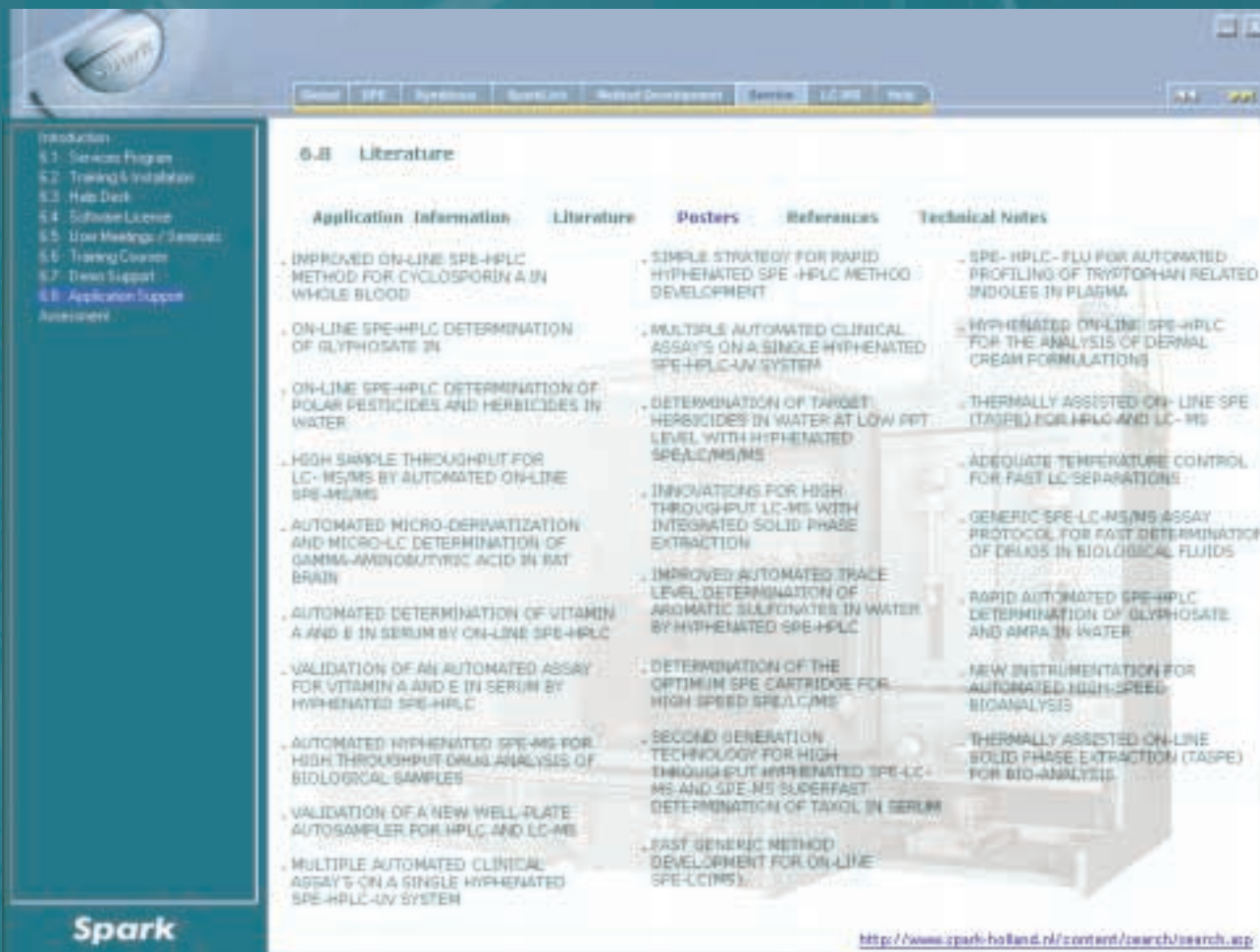
# LC-MS section

- Flow rates & flow splitting
- Solvents, buffers and additives
- APCI
- ESI
- Mass analyzers
- Ion detection, tuning and calibration

The screenshot displays a software interface with a table of contents on the left and a main content area on the right. The table of contents includes sections such as '7.1 Flow Rates and Flow Splitting', '7.1.1 Introduction and Key Terms', '7.1.2 APCI Interface Types', '7.1.2.1 Interface Similarities', '7.2 Solvents, Buffers and Additives', '7.3 Electrospray Ionization (ESI)', '7.4 Mass Analyzers', and '7.5 Ion Detectors, Tuning & Calibration Assessment'. The main content area features a diagram of a 'LIQUID-GAS INTERFACE' showing 'Evaporation' of neutral analyte species ( $M^0_{(g)}$ ) and 'Desorption' of charged analyte species ( $M^{\pm}_{(g)}$ ) from a 'LIQUID' phase into a 'GAS' phase. Below the diagram, a section titled 'AEROSOLS' states that 'DROPLET SIZE GOVERNS SURFACE AREA' and that 'SMALLER DROPLETS = HIGHER AEROSOL SURFACE AREA'. The text on the right explains that all APCI interfaces must accelerate the following processes: evaporate liquids into gases, ionize neutrals into charged species or transfer charged species in solution to gas phase ions, evaluate large amounts of eluent, and remove the resulting vapour from the system to maintain the required level of vacuum with the mass spectrometer. It also notes that the pathway between the two sides of the diagram will determine the differences between the types of interface used, and that the energy requirements for the thermodynamic change of state are independent of the path taken from one side of the diagram to the other and will be similar for all interface types. Finally, it states that aerosols are of great importance in LC-MS as they provide the surface area from which the analyte species will evaporate into the gas phase, and that the higher the surface area, the greater the amount of evaporation and hence the greater the number of analyte species available for sampling into the mass analyzer.

# Support section

Literature in .pdf format

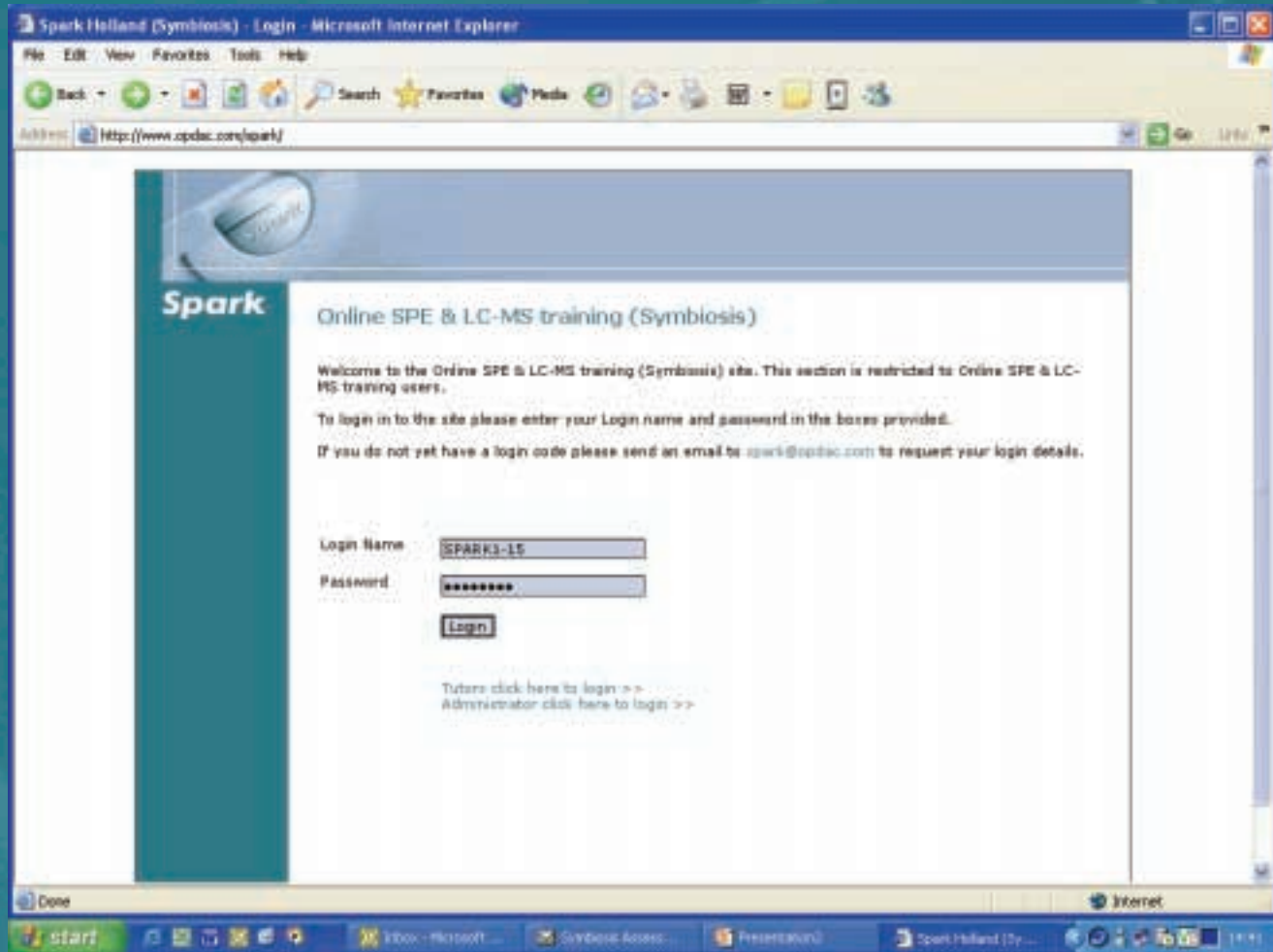


The screenshot displays the Spark software support website interface. The top navigation bar includes links for Home, SPE, Applications, Specials, Method Development, Service, LC-MS, and Help. A sidebar on the left lists various support resources, with '6.8 - Application Support Assessment' highlighted. The main content area is titled '6.8 Literature' and features a table with five columns: Application Information, Literature, Posters, References, and Technical Notes. The table lists 15 articles, each with a brief description of the research or application. The Spark logo is visible in the bottom left corner, and the URL <http://www.spark-holland.nl/content/research/research.asp> is shown in the bottom right corner.

| Application Information   | Literature | Posters  | References | Technical Notes  |
|---|------------|--|------------|--|
| IMPROVED ON-LINE SPE-HPLC METHOD FOR CYCLOSPORIN A IN WHOLE BLOOD                                 |            | SIMPLE STRATEGY FOR RAPID HYPHENATED SPE -HPLC METHOD DEVELOPMENT  |            | SPE -HPLC - FLU FOR AUTOMATED PROFILING OF TRYPTOPHAN RELATED INDLES IN PLASMA           |
| ON-LINE SPE-HPLC DETERMINATION OF GLYPHOSATE IN   |            | MULTIPLE AUTOMATED CLINICAL ASSAYS ON A SINGLE HYPHENATED SPE-HPLC-UV SYSTEM   |            | HYPHENATED ON-LINE SPE-HPLC FOR THE ANALYSIS OF DERMAL CREAM FORMULATIONS                |
| ON-LINE SPE-HPLC DETERMINATION OF POLAR PESTICIDES AND HERBICIDES IN WATER                        |            | DETERMINATION OF TARGET HERBICIDES IN WATER AT LOW PPT LEVEL WITH HYPHENATED SPE/LC/MS/MS                                  |            | THERMALLY ASSISTED ON-LINE SPE (TASPE) FOR HPLC AND LC-MS                                |
| HIGH SAMPLE THROUGHPUT FOR LC-MS/MS BY AUTOMATED ON-LINE SPE-MS/MS                                |            | INNOVATIONS FOR HIGH THROUGHPUT LC-MS WITH INTEGRATED SOLID PHASE EXTRACTION   |            | ADEQUATE TEMPERATURE CONTROL FOR FAST LC-SEPARATIONS                                     |
| AUTOMATED MICRO-DERIVATIZATION AND MICRO-LC DETERMINATION OF GAMMA-AMINOBUTYRIC ACID IN RAT BRAIN |            | IMPROVED AUTOMATED TRACE LEVEL DETERMINATION OF AROMATIC SULFONATES IN WATER BY HYPHENATED SPE-HPLC                        |            | GENERIC SPE-LC-MS/MS ASSAY PROTOCOL FOR FAST DETERMINATION OF DRUGS IN BIOLOGICAL FLUIDS |
| AUTOMATED DETERMINATION OF VITAMIN A AND E IN SERUM BY ON-LINE SPE-HPLC                           |            | DETERMINATION OF THE OPTIMUM SPE CARTRIDGE FOR HIGH SPEED SPE/LC/MS  |            | RAPID AUTOMATED SPE-HPLC DETERMINATION OF GLYPHOSATE AND AMPA IN WATER                   |
| VALIDATION OF AN AUTOMATED ASSAY FOR VITAMIN A AND E IN SERUM BY HYPHENATED SPE-HPLC              |            | SECOND GENERATION TECHNOLOGY FOR HIGH THROUGHPUT HYPHENATED SPE-LC-MS AND SPE-MS SUPERFAST DETERMINATION OF TAXOL IN SERUM |            | NEW INSTRUMENTATION FOR AUTOMATED HIGH-SPEED BIOANALYSIS                                 |
| AUTOMATED HYPHENATED SPE-MS FOR HIGH THROUGHPUT DRUG ANALYSIS OF BIOLOGICAL SAMPLES               |            |  |            | THERMALLY ASSISTED ON-LINE SOLID PHASE EXTRACTION (TASPE) FOR BIO-ANALYSIS               |
| VALIDATION OF A NEW WELL-PLATE AUTOSAMPLER FOR HPLC AND LC-MS                                     |            |  |            |  |
| MULTIPLE AUTOMATED CLINICAL ASSAYS ON A SINGLE HYPHENATED SPE-HPLC-UV SYSTEM                      |            |  |            |  |



# Web-based assessment



The screenshot shows a Microsoft Internet Explorer browser window displaying the Spark login page. The browser's address bar shows the URL <http://www.opdc.org/spark/>. The page features a teal sidebar with the 'Spark' logo and a main content area with the following text:

**Spark** Online SPE & LC-MS training (Symbiosis)

Welcome to the Online SPE & LC-MS training (Symbiosis) site. This section is restricted to Online SPE & LC-MS training users.

To login in to the site please enter your Login name and password in the boxes provided.

If you do not yet have a login code please send an email to [spark@opdc.com](mailto:spark@opdc.com) to request your login details.

Login Name:

Password:

Tutors click here to login >>  
Administrator click here to login >>

The browser's taskbar at the bottom shows the Windows Start button, several open applications including Outlook and Firefox, and the system tray with the date and time (11:11).

# Assessment: main page

Spark Holland (Symbiosis) - Assessments & Resources - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail

Address http://www.spdc.com/spark/student/default.asp

Matthew McQueen Logged In  
Rick Bedworth Tutor Name  
rick@spdc.com Tutor Email

**Math**  
Main Page  
Logout

**Assessments**  
View Assessments

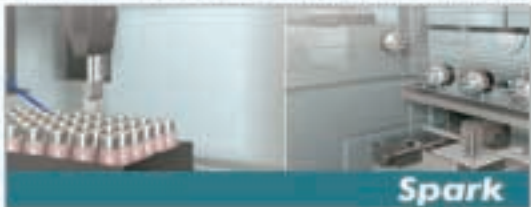
**Contact**  
Email Tutor  
Email Support

## Online SPE & LC-MS training (Symbiosis)

**Welcome to the Online SPE & LC-MS training (Symbiosis) site.**

From within the site you have access to online assessments, assessment progress and the ability to contact your tutor.

To navigate your way around the site please use the menu on the left hand side.



**To complete an assessment.**

Click on the link in the left hand menu.

Choose the assessment you wish to attempt and click the 'Attempt now' button.

Answer each question and submit your assessment to be marked online.

Your overall score and feedback will be displayed automatically.

**Spark**

If you have any problems using the site or have technical queries then please contact: [spark@spdc.com](mailto:spark@spdc.com)

Done

start | 3:00 - Microsoft... | Symbiosis Assess... | Firefox (K) | Spark Holland (S... | 11:10



# Overview assessment results

The screenshot shows a web browser window titled "Spark Holland (Symbolics) - Assessments & Resources - Microsoft Internet Explorer". The address bar shows the URL "http://www.opdc.org/spark/student/default.asp". The page content includes a navigation menu on the left with sections for "Math", "Assessments", and "Contact". The main content area is titled "Assessment Summary" and contains the following information:

You are now viewing the list of assessments. To view a particular assessment or to complete an assessment click on the link provided.

| Assessment Name                   | Max attempts allowed | Attempted   | Score           | Status  | Details                             |
|-----------------------------------|----------------------|---|-----------------|---|-------------------------------------|
| Assessment 1 - Global             | 3                    | 12/08/2004 10:17:21<br>02/05/2004 09:53:58                        | 0%<br>14%       | Credit not gained<br>Credit not gained                  | [Details]<br>[Details]              |
| Assessment 2 - SPE                | 3                    | 11/08/2004 10:17:22<br>19/08/2004 12:23:41<br>26/08/2004 10:58:25 | 65%<br>0%<br>7% | Credit gained<br>Credit not gained<br>Credit not gained | [Details]<br>[Details]<br>[Details] |
| Assessment 3 - Symbolics          | 3                    |   |                 |   |                                     |
| Assessment 4 - SparkLink          | 3                    | 24/08/2004 09:10:23   | 11%             | Credit not gained                                       | [Details]                           |
| Assessment 5 - Method Development | 3                    | 18/08/2004 10:58:29<br>13/08/2004 10:58:29                        | 0%<br>0%        | Credit not gained<br>Credit not gained                  | [Details]<br>[Details]              |

Additional text on the page includes: "You have exceeded the maximum attempts; please contact your tutor for further information." and "Contact tutor" button.

# Example of questions

**Question 6 of 7**

Flexibility in sample type and the ability to process any automated sample preparation systems are essential for HPLC-MS systems.

- Generic solvents such as polyesters are used for extraction.
- Generic on-line sample extraction protocols are used because the sample is in a 'container' when using generic protocols.
- It is often necessary to use a grade CPE analysis.
- The ability to select a variety of different traditional liquid / liquid extraction methods is essential.
- Heating the solvent cartridge can be used for precipitation protocols.
- Flow rate is not so important for sample processing using HPLC-MS systems.

**Question 7 of 7**

The ability to rapidly develop methods is essential for HPLC-MS systems to improve laboratory throughput. Choose the correct answer below:

In HPLC-MS, extraction methods are usually developed using a [PLEASE SELECT] solvent. Extraction cartridges are placed in [PLEASE SELECT] and are usually loaded with a [PLEASE SELECT] solvent.

To assess the level of sample breakthrough the analysis is carried out using a [PLEASE SELECT] solvent. The first cartridge is then eluted to assess and the second cartridge is then [PLEASE SELECT] solvent.

Using HPLC-MS analysis systems this phenomenon is investigated. If recovery is low but tubing adsorption is found to be a problem then [PLEASE SELECT] should be investigated.

**Question 10 of 13**

Understanding the hydraulic flow paths through the Symbolix system is essential for effective and efficient operation. Using the labeled flow diagram above, answer the following questions regarding the hydraulic flow paths and valve configuration of the system.

Select the correct hydraulic flow path for the following operations:

[PLEASE SELECT]

[PLEASE SELECT]

[PLEASE SELECT]





# Direct feedback assessment


Assessment 3 - Symbiosis - Microsoft Internet Explorer

Question 1 of 13

A fundamental concept in increasing laboratory throughput is the flexibility of Symbiosis in handling high numbers of samples in different matrices and containers. Select the statements regarding the Plate Stacker and Autosampler from the following list that you AGREE with:

- The ability to control the temperature of samples waiting for analysis is not so critical with high throughput applications.
- Theoretically the Plate Stacker module can hold up to 9216 samples.
- In a warm laboratory environment the plate stacker and autosampler module can be cooled to -40C.
- The temperature stability of the plate stacker is to within + or - 100C over a typical run.
- User Defined Plate configurations are specified within the 'Autosampler' / 'Properties' screen of SparkLink.
- Both deep well and shallow well plates may be user defined.
- It would be possible to fill the plate stacker with a tray full of autosampler vials from different HPLC instrument so long as the sampler rack fitted onto a carrier plate in the Plate Stacker.

Well done, you have passed this question. There were 3 correct answers of which you identified 3 successfully. (You identified 1 answer as being correct when it was incorrect)



Question 2 of 13

The accuracy, precision and reliability of the autosampler is at the heart of the Symbiosis system. Without a very high quality autosampler, it would be impossible to obtain fit for purpose data from many hundreds of samples using unattended operation. Choose from the list below those statements that you believe are TRUE (note - there may be more than one correct response):

- It is possible to inject 1.5µl of sample with a precision of 0.5% RSD.
- It is possible to use several different wash solvents to ensure that all potential contaminants are removed from the autosampler between sample injections.
- It would be possible to program the autosampler to deliver 100µl of methanol followed by 2ml of 0.1% buffer at pH 2.5 to wash the autosampler flow path.
- The outside of the sampling needle can be washed using a different solvent from that used to wash

Done

start | Internet | Assessment...



# Direct feedback assessment

Assessment 3 - Symbiosis - Microsoft Internet Explorer

Question 2 of 13


The accuracy, precision and reliability of the autosampler is at the heart of the Symbiosis system. Without a very high quality autosampler, it would be impossible to obtain fit for purpose data from many hundreds of samples using unattended operation. Chose from the list below those statements that you believe are TRUE (note - there may be more than one correct response):

- It is possible to inject 1.5µl of sample with a precision of 0.5% RSD.
- It is possible to use several different wash solvents to ensure that all potential contaminants are removed from the autosampler between sample injections.
- It would be possible to program the autosampler to deliver 100µl of methanol followed by 2ml of 0.1% buffer at pH 2.5 to wash the autosampler flow path.
- The outside of the sampling needle can be washed using a different solvent from that used to wash the inside of the needle.
- Fast HPLC applications benefit from the rapid 80ms injection valve switching time by maintaining narrow sample bands when the system is used in LC mode.
- A full injection and wash cycle should take around 30 secs., which will add to the total analysis time when the system is operating in concurrent mode.
- The autosampler will cool samples to 40C if required.
- It would be possible to sample supernatant from a vial containing spun down precipitated protein.


Unfortunately you have not passed this question. There were 7 correct answers of which you identified 7 successfully. (You identified 1 answer as being correct when it was incorrect)

Please return to sections 3.2.1 to 3.2.2 and study carefully.

Question 3 of 13



Position 1:2



Position 6:1

Done Internet

start | taskbar | Symbiosis A... | Presentation2 | Spiral Hellen... | Assessment... | 11:49



# Management: report assessment results

- Progress report for management

## Performance Summary for P. Scientific.

You are now viewing the performance summary of learners.

| Learner   | Tutor | Credits Gained | Last Assessment Information |           |                   |
|-----------|-------|----------------|-----------------------------|-----------|-------------------|
| Learner 1 | Nick  | (0/6)          | (N/A)                       |           |                   |
| Learner 2 | Nick  | (0/6)          | (N/A)                       |           |                   |
| Learner 3 | Nick  | (3/6)          | Assessment 3 - Symbiosis    | 13/9/2004 | Credit gained     |
| Learner 4 | Tony  | (1/6)          | Assessment 2 - SPE          | 24/8/2004 | Credit not gained |
| Learner 5 | Tony  | (0/6)          | (N/A)                       |           |                   |

First < > Last

Page: 1 of 1



**Questions ?**