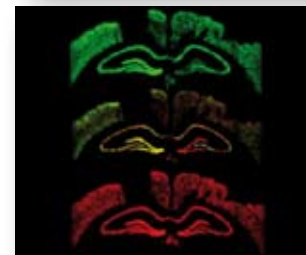
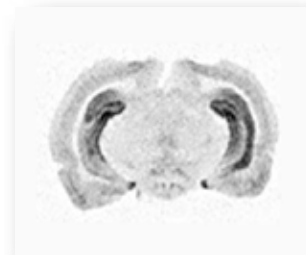
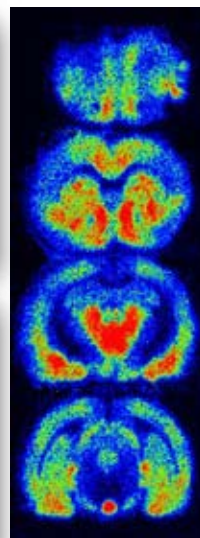
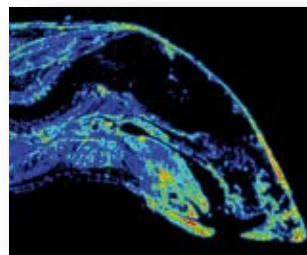




# Beta Imager & Micro Imager

Quantitative Autoradiography Systems  
High Throughput & High Resolution



Biochemistry

Biodistribution

Cancer Research

Cardiovascular Research

Genomics

Infectious Diseases

Neurosciences

Nuclear Medicine

Pharmacology

Physiology

Plant Science

The Beta Imager™ and the Micro Imager™ are unique solutions designed by Biospace Lab for quantitative autoradiography. Ultra fast with excellent sensitivities, the imagers require few hours only to make acquisitions, when film or phosphor imagers may need days or weeks.

Their real-time capability, with the instantaneous display of the detected signal, avoids under or over exposure risks.

The systems detect all usual beta emitting isotopes ( $^3\text{H}$ ,  $^{14}\text{C}$ ,  $^{32}\text{P}$ ,  $^{35}\text{S}$ ,  $^{125}\text{I}$ ), gamma emitting isotopes ( $^{123}\text{I}$ ,  $^{131}\text{I}$ ,  $^{99\text{m}}\text{Tc}$ ,  $^{201}\text{Tl}$ ,  $^{111}\text{In}$ ) and positron emitting (PET) isotopes. The performances obtained for tritium imaging are outstanding and unequalled.

An exclusive patented technology makes possible the simultaneous imaging and discrimination of multiple emitters, so that multi labeling becomes a reality in autoradiography.

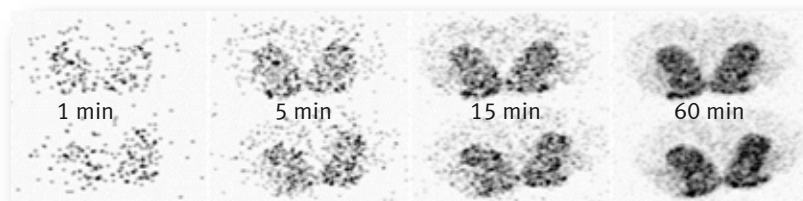
Whether you need fast, sensitive and high throughput autoradiography with the Beta Imager™, or fast, sensitive and high resolution autoradiography with the Micro Imager™, your solution is Biospace Lab.

## Unmatched sensitivity cuts imaging from weeks to hours

- Films or phosphor screens lack sensitivity to low energy isotopes such as tritium
- Biospace Lab's instruments count all emitted particles, regardless their energy, resulting to up to 500 times (Beta Imager™) and 50 times (Micro Imager™) shorter exposures.
- Biospace Lab's systems have a unique sensitivity to tritium, being able to detect tritium levels as low as 0.007 cpm/mm<sup>2</sup>

## Real-time acquisition

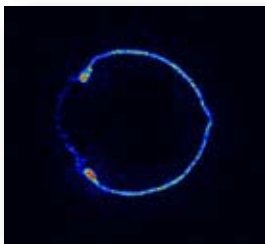
- Films or Phosphor screens require blind acquisition with two steps of process: expose and scan
- Biospace Lab's instruments accumulate and display counts in real-time:
  - Forget your under or over exposition problems
  - Follow-up your image acquisition during all your experiment



Distribution of D1 receptors ([<sup>3</sup>H]SCH23390) in the rat striatum  
*Courtesy of Janssen Research Foundation*

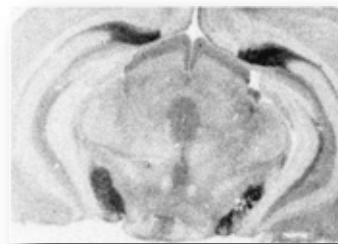
## Digital autoradiography

- Film emulsions were the only techniques with resolutions compatible with micro-autoradiography
- Biospace Lab's instruments can achieve a resolution of 15 μm



Choroid membrane of a rat eye labeled with <sup>14</sup>C

*Courtesy of Dr Delbos, Servier Laboratories, Orléans, France*



Serotonin receptor labeled with <sup>125</sup>I on rat brain section

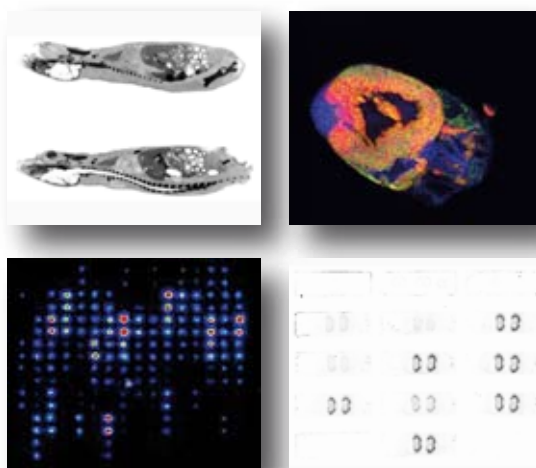
*Courtesy of L. Ségu, CNRS URA 339, Bordeaux, France*

## Patented simultaneous discrimination of multi-emitters

- Simultaneous dual-labeling made possible : identify each isotope contribution from a single acquisition
- Separation can be based on energy (2 isotopes) or time decay (2 isotopes or more)
- Examples of dual-detection <sup>3</sup>H/<sup>14</sup>C, <sup>3</sup>H/<sup>35</sup>S, <sup>3</sup>H/<sup>32</sup>P or <sup>33</sup>P and multi-detection <sup>99m</sup>Tc/ <sup>111</sup>In/<sup>18</sup>F
- With digital autoradiography and its unique isotope discrimination feature, new challenges can now find a solution and enable new powerful and accurate protocols, focusing on the distribution several molecules simultaneously:
  - Co-localization of different receptors, or receptors and messenger proteins
  - Functional activity and pathological events
  - Comparison of gene expressions with a reference gene

# A large domain of applications

|  | Beta Imager™ | Micro Imager™ |
|--|--------------|---------------|
| <b>Physiology/Anatomy</b>                |              |               |
| Neurology                                | Yes          | Yes           |
| Cardiology                               | Yes          | Yes           |
| <b>Immunology &amp; Cellular Biology</b> |              |               |
| Receptor Binding Assays                  | Yes          | Yes           |
| In Situ Hybridization                    | Yes          | Yes           |
| <b>Pharmacokinetics &amp; Toxicology</b> |              |               |
| Whole body Autoradiography               | Yes          | No            |
| Thin Layer Chromatography                | Yes          | No            |
| <b>Molecular Biology</b>                 |              |               |
| Electrophoresis Gels                     | Yes          | No            |
| Macroarrays                              | No           | Yes           |



# Technical specifications

|                                  | Beta Imager™   | Micro Imager™   |
|----------------------------------|--|---|
| <b>Technology</b>                |  |   |
| Detector                         | Gaseous particle detector  | Scintillating foil                                      |
| Camera                           | Intensified CCD Camera   | Intensified CCD Camera                                  |
| <b>Performance</b>               |  |   |
| Pixel size resolution            | 5 µm   | 1 µm  |
| Minimum spatial resolution       | From 50 µm to 200 µm according to isotope and zoom   | 15 µm to 25 µm according to isotope                     |
| Field of View (FOV)              | 15 microscope slides: 200 mm x 250 mm<br>6 microscope slides: 120 mm x 160 mm<br>2 microscope slides: 75 mm x 100 mm<br>Half microscope slide: 25 mm x 33 mm   | 24 mm x 32 mm   |
| Linearity                        | Linear response over a dynamic range of 10 <sup>4</sup>  | Linear response over a dynamic range of 10 <sup>4</sup> |
| <b>Multilabelling Capability</b> |  |   |
| Energy Separation                | 3 different families of beta emitters can be separated: low energy ( <sup>3</sup> H); medium energy ( <sup>14</sup> C, <sup>35</sup> S, <sup>33</sup> P, <sup>99m</sup> Tc, ...) and high energy ( <sup>32</sup> P, <sup>18</sup> F, <sup>11</sup> C, ...) |   |
| Radioactive Decay Separation     | Beta emitters can also be separated if their respective half lives are separated by at least a factor of 2   |   |
| Cross talk (typical)             | 5 % for a <sup>3</sup> H/ <sup>14</sup> C separation   |   |
| <b>Sample Holder</b>             |  |   |
| Standard                         | Tritiated membranes<br>Non tritiated membranes ( <sup>14</sup> C, <sup>33</sup> P, <sup>35</sup> S, ...)<br>15 microscope slides   | Automatic 4 microscope slides sample changer            |
| On request                       | Multi-isotopes sample holder<br>1 slide (127 x 178 mm) special sample holder<br>4 slide (120 x 170 mm) special sample holder<br>9 slide (51 x 76 mm) special sample holder<br>12 slide (38 x 76 mm) special sample holder                                  |   |
| <b>Softwares</b>                 |  |   |
| Image Acquisition                | Beta Acquisition Software  | Micro Acquisition Software                              |
| Image Analysis                   | M <sup>3</sup> Vision Analysis Software  | M <sup>3</sup> Vision Analysis Software                 |
| Data Formats                     | Bitmap, JPEG, illustration & quantitative TIFFs, ASCII   | Bitmap, JPEG, illustration & quantitative TIFFs, ASCII  |
| <b>System Requirements</b>       |  |   |
| Operating Systems                | Windows 2000/XP  | Windows 2000/XP   |
| Power Consumption                | Maximum : 250 W at 230 V or 115 V  | Maximum : 50 W at 230 V or 115 V                        |
| Dimensions                       | 75 x 70 x 160 cm (WxDxH)   | 40 x 45 x 75 cm (WxDxH)                                 |
| Weight                           | 140 kg   | 45 kg   |

VERSION: March 2009