



Center for Subsurface Sensing and Imaging Systems (CenSSIS)

Online Image Tagging Using XML and Java

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Outline

- **The CenSSIS Image Database**
- **XML and Java**
- **Image Tagging Overview**
- **Tags and XML**
- **Image Tagging Implementation**
- **Image Tagging Interface**
- **Role of Image Tagging**



The CenSSIS Image Database

- **Effective Data Management**
 - **Fast and Efficient Retrieval**
 - **Extensible Metadata Formats**
- **Collaborative Research**
 - **Web-Based Interface**
 - **Provides Standards**



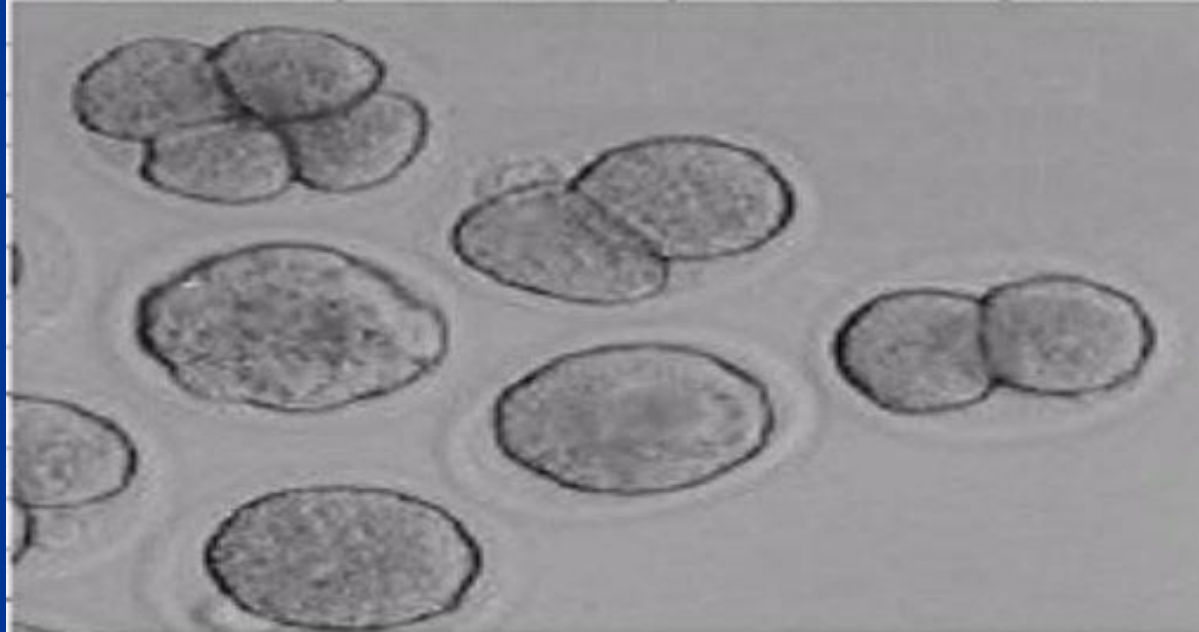
XML and Java

- **XML (Extensible Markup Language)**
 - Provides Maximum Flexibility
 - Well-Supported Standard
 - Powerful Querying
- **The Java 2 Platform**
 - Cross-Platform Compatibility
 - Native XML Support



Image Tagging

Raw Image File from CenSSIS DB:

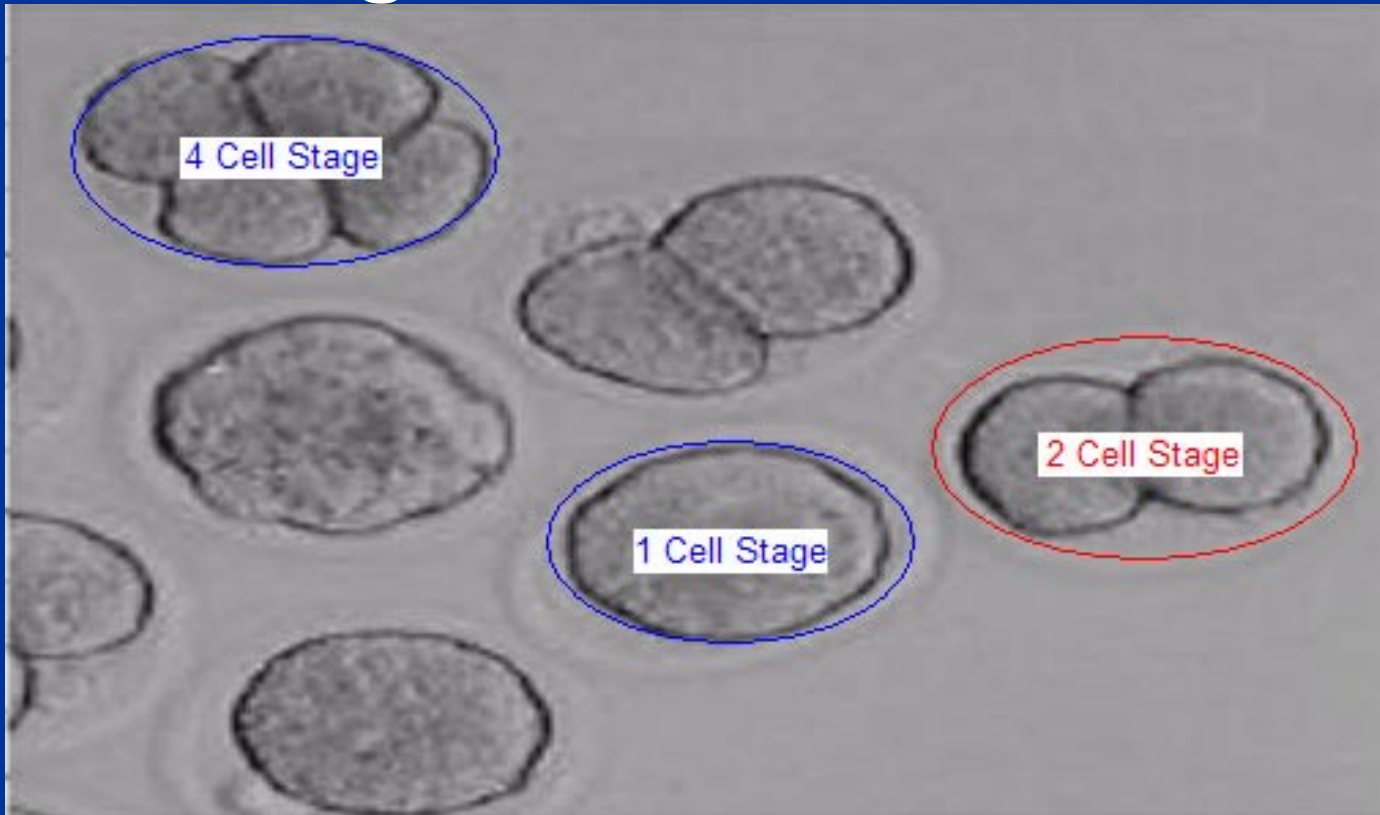


- **Difficult to Describe Areas of Interest**
- **Difficult to Find Specific Features in Images**
- **Global Image Metadata Too Coarse**



Image Tagging

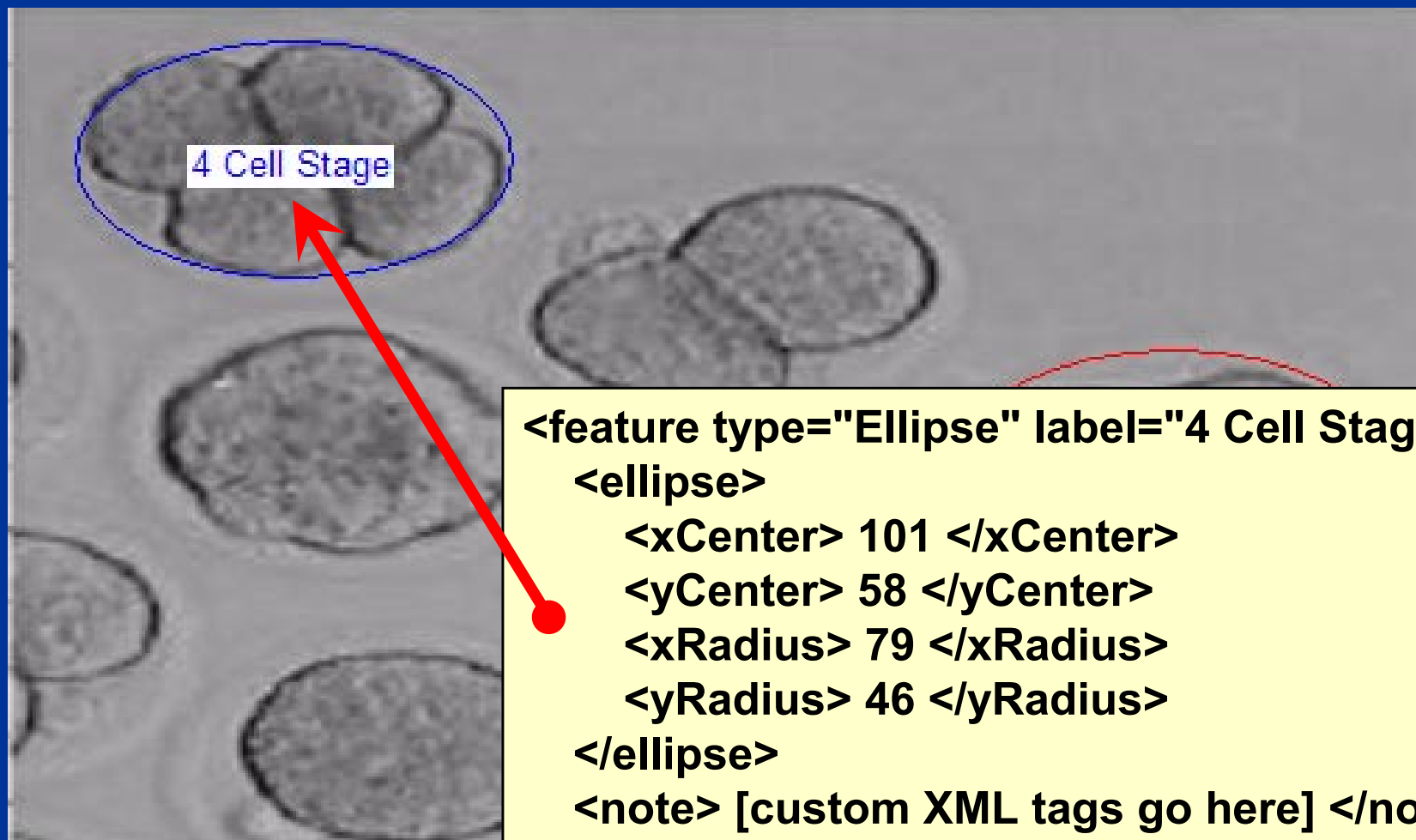
Image with Tags



- Metadata Associated with Specific Areas
- Query for Specific Image Features



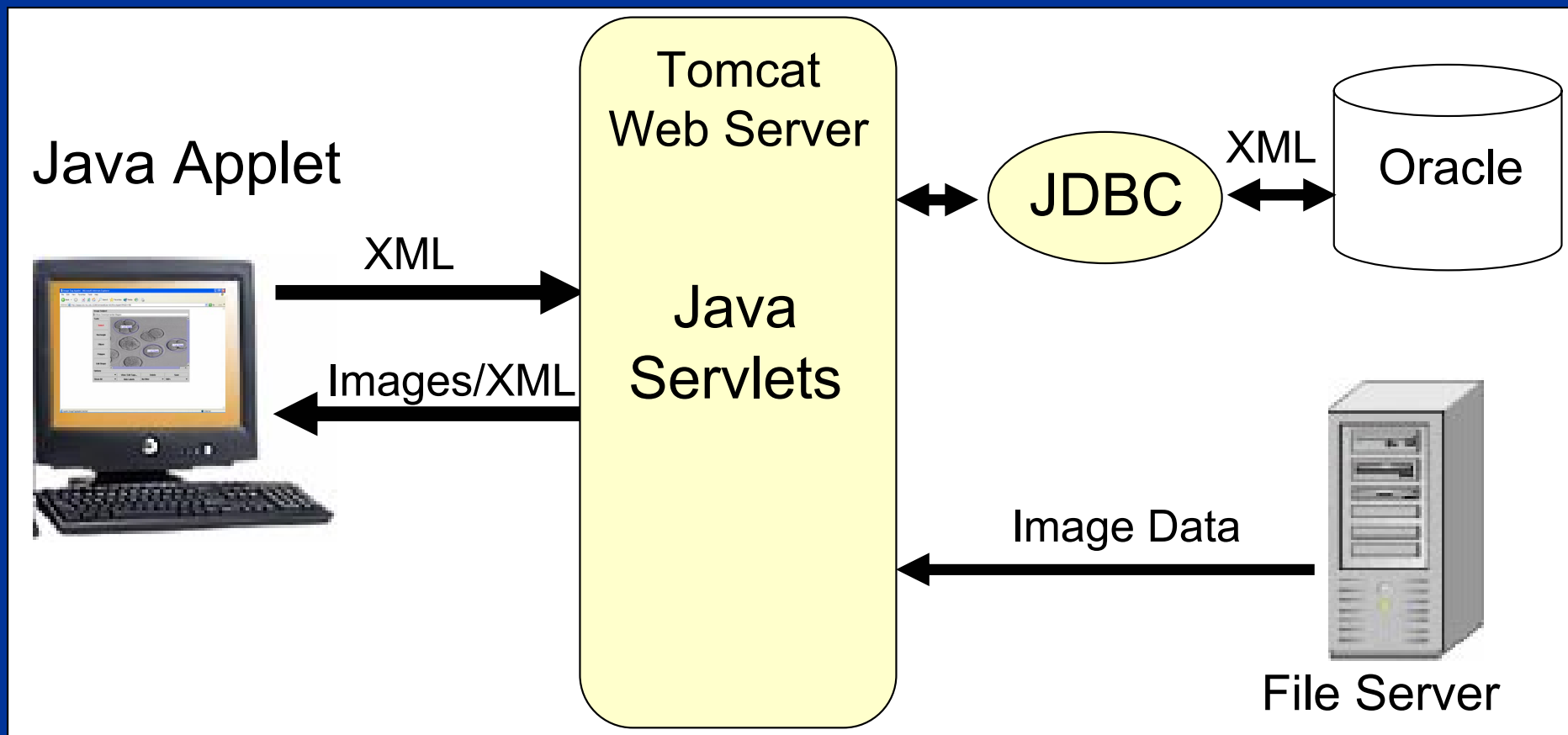
Tags and XML



```
<feature type="Ellipse" label="4 Cell Stage">  
  <ellipse>  
    <xCenter> 101 </xCenter>  
    <yCenter> 58 </yCenter>  
    <xRadius> 79 </xRadius>  
    <yRadius> 46 </yRadius>  
  </ellipse>  
  <note> [custom XML tags go here] </note>  
  <annotator> awilliam </annotator>  
</feature>
```



Image Tagging Implementation





The Image Tagging Interface

Image Subject
Embryo Developmental Stages

Tools

- Select
- Rectangle
- Ellipse
- Polygon
- Edit Shape

Options

2 Cell Stage	View / Edit Tags...	Delete	Save
Show All	Hide Labels	No Filter	100%

Drawing
Tools

Tag
Options

View Options



Role of Image Tagging

- **Provide More Refined Metadata**
 - **Allow More Delicate Queries**
 - **Queries on Tag Metadata Could Show Relationships Between Images Not Apparent in Global Metadata**
- **Collaboration Tool**
 - **Encourage Metadata Standards**
 - **Near Real-Time Response**



Conclusions

Image Tagging improves the quality, consistency, and usefulness of the data by providing...

- **Flexible Metadata**
- **Support for Standards**
- **Better Queries**
- **Enhanced Collaboration**