

Using AI to create Alt-Text

# Definition & History of Alt-Text

- Alternative Text (Alt-Text)
- Introduced in 1993 to allow text-based web browsers to interpret image content
- Starting in 1999 (with HTML 4.01), the use of Alt-Text became required due to recognition as an important resource to improve accessibility to the web especially for visually impaired users

```
<figure>  
    
  <figcaption>An elephant at sunset</figcaption>  
</figure>
```

- Also allows for:
  - Text display if image-loading fails
  - Used by search engines and web-bots

# Use of Alt-text for the Visually Impaired

- Important for:
  - Screen Readers
  - Braille Displays



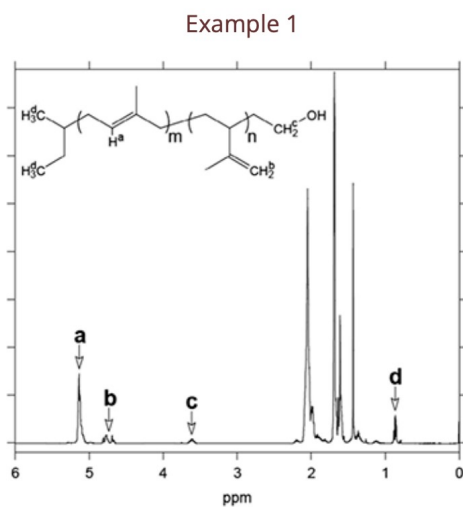
# Guidelines for Alt-Text from WebAIM.org

- Good Alt-Text should:
  - Be accurate and equivalent to the image content and function
  - be succinct – using as few words as possible
  - NOT use redundant information
    - Such as “Image of...”
    - Details available in the actual text
  - If the image is decorative, no Alt-Text is required

# Guidelines for Scientific Publications

- Taylor And Francis have a guidelines for science authors
- Overall take-home message from their examples:
  - Follow similar guidelines as per [WebAIM.org](http://WebAIM.org)
  - Alt-text is short and succinct
  - Image details are contained within the actual narrative
  - Long descriptions can be provided if the actual narrative doesn't provide the the necessary detail

# Example of Alt-Text from Taylor & Francis



## Caption

$^1\text{H}$  NMR spectrum of a polyisoprene sample, discussed in Example 1.7. (Data courtesy of N. Lynd and M.A. Hillmyer.)

## Alt Text

A graph shows the  $^1\text{H}$  NMR spectrum of a polyisopropene sample for different  $p$   $m$  values.

## Long Description

The horizontal axis is labeled  $p$   $p$   $m$  and ranges from 6 to 0, in increments of 1. The graph shows a skeletal structure consisting of a chain of 11 carbon atoms. The carbon group in the first position, labeled  $\text{C H } 2$  superscript  $c$ , is bonded to a hydroxyl group. The carbon atom in the third position is bonded to the central atom of an isopropene group. The carbon group at the end of the double bond is labeled  $\text{C H } 2$  superscript  $b$ . A double bond exists between the carbon atoms in the sixth and seventh positions. The hydrogen atom bonded to the carbon in the seventh position is labeled  $\text{H}$  superscript  $a$ . The carbon group in the eleventh position is labeled  $\text{C H } 3$  superscript  $d$ . The carbon atom in the tenth position is bonded to an ethyl group, whose terminal carbon group is labeled  $\text{C H } 3$  superscript  $d$ . A pair of parentheses enclosing the third and fourth carbon atoms is labeled  $n$ . A pair of parentheses enclosing the fifth, sixth, seventh, and eighth carbon atoms is labeled  $m$ . The peaks at different  $p$   $p$   $m$  values in the decreasing order of height are as follows:  $p$   $p$   $m$  equals 1.6,  $p$   $p$   $m$  equals 1.4,  $p$   $p$   $m$  equals 2,  $p$   $p$   $m$  equals 5.1, labeled  $a$ ,  $p$   $p$   $m$  equals 0.8, labeled  $d$ ,  $p$   $p$   $m$  equals 4.8, labeled  $b$ , and  $p$   $p$   $m$  equals 3.6, labeled  $c$ .

# Can AI be used to create AI-Text for scientific images?

- Many older scientific publications do not included Alt-Text
- The development and improvement of AI should make the creation of Alt-Text easier and faster

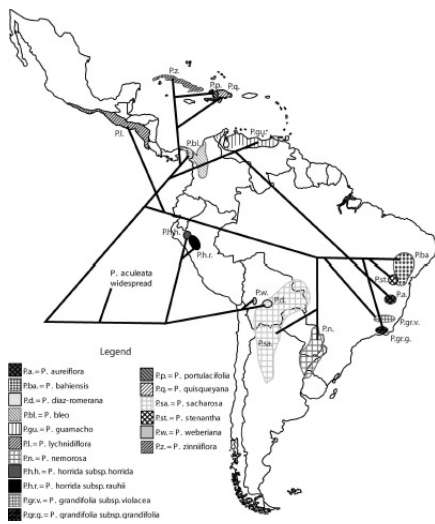
# Testing AI for Alt Text

- Many AI implementations for generating Alt Text
- Many/Most require significant coding skills to implement
- “Turnkey” apps require subscriptions
- Astica.ai was tested in this investigation
  - Vision package

**asticaVision v2.0\_full - Pay as You Go**  
asticaVision v2.0\_full enables access to more powerful computer vision capabilities at a slightly increased cost.

<b>OCR - Detect and Read Text</b> Use computer vision to read the words within an image and convert them into text.	\$0.00195 / Image
<b>Image Description</b> Provides an accurate caption of the image. Approximately 1 sentence or less.	\$0.00195 / Image
<b>Alternative Captions</b> Provides a list of alternative captions. Each caption approximately 1 sentence or less.	\$0.00165 / Image
<b>GPT-S Description</b> Extended, detailed image description up to 300 words.	<a href="#">Scroll to</a>
<b>Image Tagging</b> Generate a list of tags for an image. Longer and more accurate than v1.0	\$0.00115 / Image
<b>Object Detection</b> Offers improved object labeling and bounding box accurate for objects detected within an image.	\$0.00115 / Image





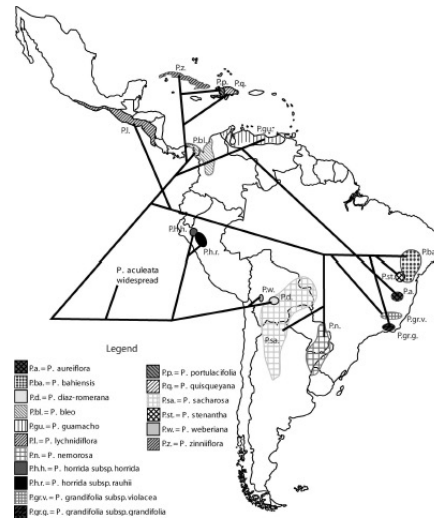


FIG. 2. Distribution and biogeography of *Pereskia*. The cladogram is adapted from the most parsimonious tree shown in Fig. 1 and distributions are for assumed natural populations after Leuenberger (1986).

*Pereskia aureiflora* (Brazil) and *P. guamacho* (Colombia and Venezuela) comprise the Guamacho Group which corresponds to one of Leuenberger's (1986) species groups. This group is noteworthy as it contains the only species with yellow flowers and provides possible evidence of an independent, long-distance dispersal event from northern South America into Brazil.

Astica.ai

A

Browser tabs: ChatGPT, How to fix Mac screenshots not working, The Complete Guide to AI Image Processing, Describe Images With AI: Scenes, Faces, Objects or Text | astica...

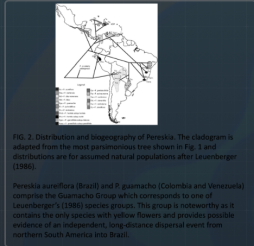
Browser address bar: astica.ai

Navigation menu (left): Account, Dashboard, Account, Documentation, Vision AI, Try Online: Moderate Images, Detect Faces, Detect Objects, Describe and Caption, Tag and Categorize, Read Text (OCR), Developer API, API Documentation, Hearing AI, Voice AI, Natural Language, Create a Custom Model, Platform, View System Status, Need help?

### Computer Vision AI Describe and Caption

#### asticaVision - Image AI

**Describe**



**Image Moderation AI**  
Safe Content

**GPT-5 Description**

This image is a complex, detailed black and white illustration of a map, which has an artistic sketch-like quality to it. The map is filled with text and symbols, indicating that it might be depicting various geographical locations. While it has the appearance of a world map, it seems to be more specialized, perhaps representing certain plant distribution across different regions. A conspicuous feature of the image is its extensive use of text annotations. Various abbreviations like 'P.aculeata', 'P.bahienis', 'P.portulacifolia', 'P.quisqueyana' and more are spread throughout, likely representing different species of plants. A legend is also present, providing a key to understanding these abbreviations. Furthermore, there are numerous lines and symbols interspersed within the text, suggesting different routes or perhaps indicating the spread or density of the named plant species. The image also seems to contain Latin names of plant species, hinting at a scientific or botanical context. Despite its black and white color scheme, the image is striking due to its detailed nature and illustrative style. The combination of text, symbols, and lines gives it an abstract and non-photographic appearance, which adds to its appeal. This image is not only an artistic representation but also serves a scientific purpose, making it a fusion of art and science.

**Copy**

**Analyze Another Image**  
Add Image Take Photo Back to File List

**Vision AI Output**

Category: Abstract Nonphoto

Image Caption: A screenshot of a map.

Facial Recognition: No faces detected.

Object Detection: No objects detected.

Additional Captions:  
• A map of the world with different lines and symbols.

OCR:  
phr  
P. aculeata  
widespread  
Ho/P.gr.v.  
.gr.g.  
Legend  
Pa. = P. aureiflora  
P.bo. = P. bahiensis  
P.p. = P. portulacifolia  
P.o. = P. quisqueyana  
P.d. = P. diez-romerana  
Psa. = P. sacharosa  
P.bl. = P. bleo  
P.st. = P. stenantha  
P.gu. = P. guamacho  
P.w. = P. weberiana  
P.l. = P. lychnidiflora  
Pz. = P. zinniflora  
P.n. = P. nemorosa  
P.h.h. = P. horrida subsp. horrida  
P.h.r. = P. horrida subsp. rauhi  
P.gov. = P. grandifolia subsp. violacea  
Por.q. = P. grandifolia subsp. grandifolia

Image Tags: sketch drawing text illustration black and white art

# Astica.ai

- This image is a complex, detailed black and white illustration of a map, which has an artistic sketch-like quality to it. The map is filled with text and symbols, indicating that it might be depicting various geographical locations. While it has the appearance of a world map, it seems to be more specialized, perhaps representing certain plant distribution across different regions. A conspicuous feature of the image is its extensive use of text annotations. Various abbreviations like 'P.aculeata', 'P.bahienis', 'P.portulacifolia', 'P.quisqueyana' and more are spread throughout, likely representing different species of plants. A legend is also present, providing a key to understanding these abbreviations. Furthermore, there are numerous lines and symbols interspersed within the text, suggesting different routes or perhaps indicating the spread or density of the named plant species. The image also seems to contain Latin names of plant species, hinting at a scientific or botanical context. Despite its black and white color scheme, the image is striking due to its detailed nature and illustrative style. The combination of text, symbols, and lines gives it an abstract and non-photographic appearance, which adds to its appeal. This image is not only an artistic representation but also serves a scientific purpose, making it a fusion of art and science.

# Image # 2

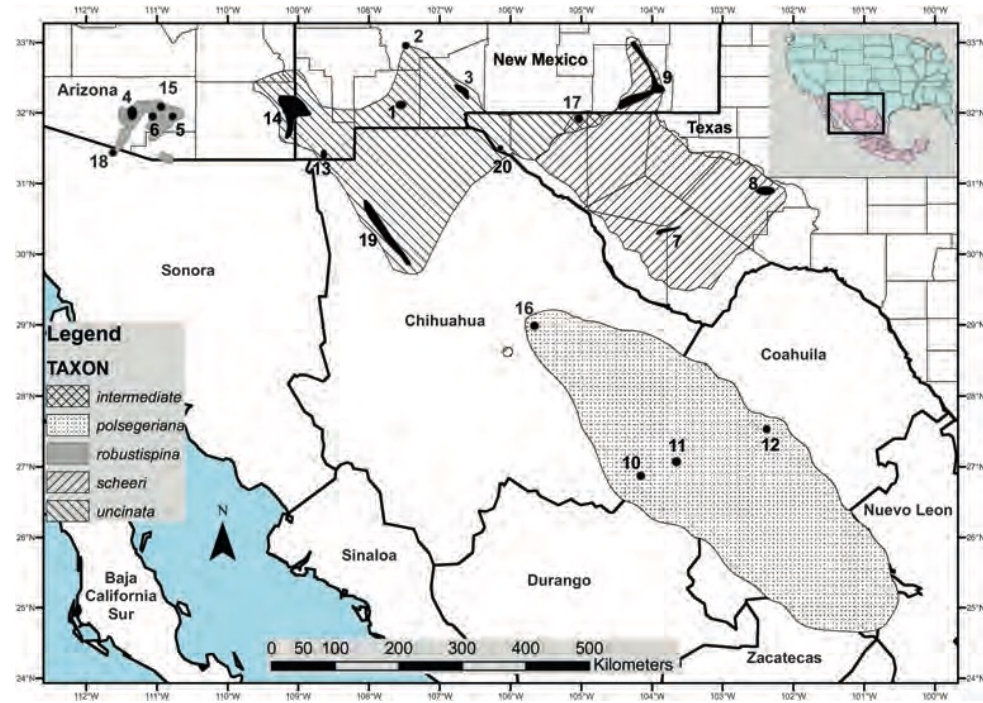


Fig. 1. Approximate distribution of *Coryphantha*, section *Robustispina* based on Arizona Game and Fish Department (2005), Baker collections, A. Zimmerman (personal communication), Powell and Weedon (2004), and Bravo-Hollis and Sánchez-Mejorada (1991), with locations of study sites used in the morphological and DNA microsatellite analyses represented by black dots for small sample areas and black polygons for larger sample areas.

## asticaVision - Image AI



Vision AI



Describe



View API

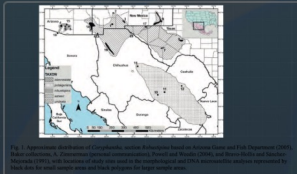


Fig. 1. Approximate distribution of *Cyrtopodius* species. Distribution based on Arizona State and Fall (Agarwal et al., 2018), Arizona (Agarwal et al., 2018), and Mexico (Agarwal et al., 2018). The map shows the approximate distribution of *Cyrtopodius* species in Mexico. The map is based on the work of Agarwal et al. (2018) and Agarwal et al. (2018). The map shows the approximate distribution of *Cyrtopodius* species in Mexico. The map is based on the work of Agarwal et al. (2018) and Agarwal et al. (2018).

Image Moderation AI

Safe Content

### GPT-5 Description

This image showcases a detailed map of the Mexican state. Predominantly white in color, the map is marked with various geographical details such as longitude and latitude lines. It also includes the names of neighboring states such as New Mexico, Arizona, Texas, and Sonora. There are two distinct illustrations of animals on the map, adding a unique element to its design. One of the animals is located towards the middle-right section of the map, while the other one is towards the top-left portion. Both animals appear to be mammals, possibly representing native species of the region. Among the geographical information, there are several numerical data points dispersed across the map, possibly indicating specific locations or coordinates. The map also includes a scale in kilometers, providing a sense of distance for the viewer. In addition, there's a legend on the map that includes the terms 'intermediate', 'palsegeriana', 'robustispina', 'scheeri', and 'uncinata'. These could potentially be the names of specific locations, landmarks, or species native to the area. The image also features text, enhancing its informative nature. The map seems to serve an educational or analytical purpose, perhaps used in a scholarly or scientific context.

Copy

### Analyze Another Image

Add Image

Take Photo

Back to File List

### Vision AI Output

Category:  
Abstract Nonphoto

Image Caption:  
A map of the state of Mexico.

Facial Recognition:

No faces detected.

Object Detection:

animal	0.53%	<a href="#">View</a>
mammal	0.56%	<a href="#">View</a>

Additional Captions:

OCR:

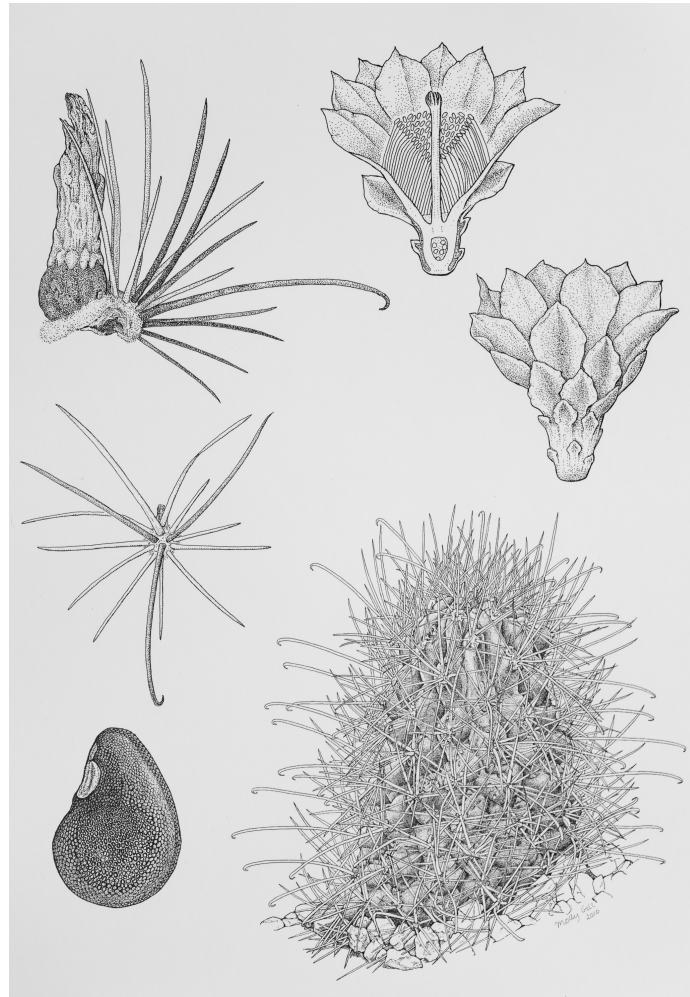
120W  
08  
102  
04-W  
33'N-  
New Mexico  
Arizona 4  
15  
17  
-32'N  
32'N  
5  
Texas  
18  
19  
Sonora  
16  
29'N  
Legend  
Chihuahua  
0  
Coahuila  
TAXON  
intermediate  
palsegeriana  
12  
robustispina  
10

# Astica.ai

- This image showcases a detailed map of the Mexican state. Predominantly white in color, the map is marked with various geographical details such as longitude and latitude lines. It also includes the names of neighboring states such as New Mexico, Arizona, Texas, and Sonora. There are two distinct illustrations of animals on the map, adding a unique element to its design. One of the animals is located towards the middle-right section of the map, while the other one is towards the top-left portion. Both animals appear to be mammals, possibly representing native species of the region. Among the geographical information, there are several numerical data points dispersed across the map, possibly indicating specific locations or coordinates. The map also includes a scale in kilometers, providing a sense of distance for the viewer. In addition, there's a legend on the map that includes the terms 'intermediate', 'palsegeriana', 'robustispina', 'scheeri', and 'uncinata'. These could potentially be the names of specific locations, landmarks, or species native to the area. The image also features text, enhancing its informative nature. The map seems to serve an educational or analytical purpose, perhaps used in a scholarly or scientific context.



Image # 3



# Computer Vision AI Describe and Caption

## asticaVision - Image AI



Vision AI



Describe



View API



Image Moderation AI

Safe Content

### GPT-5 Description

This image beautifully captures a collection of plants, each possessing elongated and slender stems. The primary focus of the image is a plant that covers a substantial portion of the picture. The artist has meticulously detailed the plant, giving it a lifelike quality. The image is not just a regular photograph but a sketch, a testament to the artist's skill and precision. Each stroke is carefully placed, providing depth and structure to the plants. The contrast between the white background and the grey of the sketch gives it a clear and crisp look, with a monochrome aesthetic that adds a touch of sophistication and simplicity. The image reminds viewers of a botanical sketch, possibly used for scientific documentation or artistic exploration. The absence of any human subjects or additional elements keeps the viewer's attention solely on the plants, highlighting their unique structure and form. The image also seems to carry a timestamp from 2010 and the artist's signature, hinting at its origin and authenticity. This beautiful sketch is a combination of art and nature, capturing the delicate balance between the two. It's a perfect blend of detail and minimalism, making it an appealing visual treat.

Copy

### Analyze Another Image

Add Image

Take Photo

Back to File List

### Vision AI Output

Category:  
Abstract Nonphoto

Image Caption:  
A group of plants with long stems.

Facial Recognition:  
No faces detected.

Object Detection:  
plant 0.55%

View

### Additional Captions:

- A drawing of a cactus.
- A black and white drawing of a pear.
- A drawing of a flower.
- A drawing of a plant.
- A drawing of a star.

### OCR:

2.07  
122  
/  
IN  
X  
2010  
molly Gill

### Image Tags:

drawing sketch

### Other Data:

Height: 3000px, Width: 2096px, Format: jpeg

# Astica.ai

- This image beautifully captures a collection of plants, each possessing elongated and slender stems. The primary focus of the image is a plant that covers a substantial portion of the picture. The artist has meticulously detailed the plant, giving it a lifelike quality. The image is not just a regular photograph but a sketch, a testament to the artist's skill and precision. Each stroke is carefully placed, providing depth and structure to the plants. The contrast between the white background and the grey of the sketch gives it a clear and crisp look, with a monochrome aesthetic that adds a touch of sophistication and simplicity. The image reminds viewers of a botanical sketch, possibly used for scientific documentation or artistic exploration. The absence of any human subjects or additional elements keeps the viewer's attention solely on the plants, highlighting their unique structure and form. The image also seems to carry a timestamp from 2010 and the artist's signature, hinting at its origin and authenticity. This beautiful sketch is a combination of art and nature, capturing the delicate balance between the two. It's a perfect blend of detail and minimalism, making it an appealing visual treat.

# Image 4

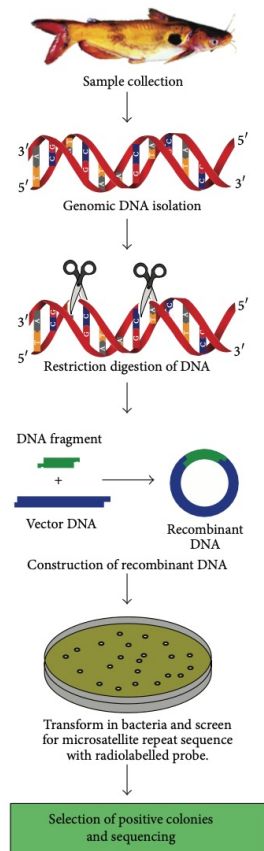


FIGURE 1: Schematic representation of traditional method of development of species specific microsatellite markers.

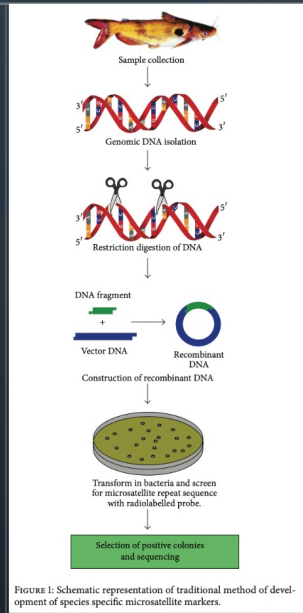


FIGURE 1: Schematic representation of traditional method of development of species specific microsatellite markers.

Image Moderation AI

Safe Content

GPT-5 Description

This is a comprehensive image illustrating the process of DNA isolation and construction of recombinant DNA. At the top of the image, a process of sample collection is depicted, followed by the isolation of genomic DNA. The diagram then shows a DNA fragment being subjected to restriction digestion, a process used to cut DNA at specific sites. This DNA fragment is then combined with Vector DNA to construct recombinant DNA. The diagram further illustrates the transformation of this recombinant DNA into bacteria and its screening for microsatellite repeat sequence using a radiolabeled probe. The process concludes with the selection of positive colonies and sequencing. The image is labeled with various DNA strands, demonstrating the 5' to 3' orientation of DNA replication. The entire process is clearly outlined in a sequence of steps, with a caption reading "Figure 1: Schematic representation of traditional method of development of species-specific microsatellite markers". The main color scheme of the image is white, with textual elements and DNA strands highlighted in different colors for differentiation. Interestingly, a fish is also detected in the image, although its relevance to the depicted process is unclear without further context. The image serves as an educational tool, likely used in scientific presentations or textbooks to explain complex genetic processes in an easy-to-understand format.

Add Image Take Photo Back to File List

Vision AI Output

Category:  
Others, Outdoor, Text Sign

Image Caption:  
A diagram of a dna structure.

Facial Recognition:  
No faces detected.

Object Detection:  
fish 0.69% [View](#)

- Additional Captions:
- A close-up of a fish.
  - A green plate with black dots.
  - A blue and green circle.
  - A red dna chain with white text.
  - Scissors cutting a dna strand.
  - A diagram of a dna strand.
  - A green rectangle with black text.

OCR:

Sample collection  
5  
3'  
V  
CG  
5  
3'  
Genomic DNA isolation  
3  
CG  
5'  
Restriction digestion of DNA  
DNA fragment  
+  
Vector DNA  
Recombinant  
DNA  
Construction of recombinant DNA  
Transform in bacteria and screen  
for microsatellite repeat sequence  
with radiolabelled probe.  
Selection of positive colonies  
and sequencing  
FIGURE 1: Schematic representation of traditional method of development of species specific microsatellite markers.

Image Tags:

text

# Astica.ai

- This is a comprehensive image illustrating the process of DNA isolation and construction of recombinant DNA. At the top of the image, a process of sample collection is depicted, followed by the isolation of genomic DNA. The diagram then shows a DNA fragment being subjected to restriction digestion, a process used to cut DNA at specific sites. This DNA fragment is then combined with Vector DNA to construct recombinant DNA. The diagram further illustrates the transformation of this recombinant DNA into bacteria and its screening for microsatellite repeat sequence using a radiolabeled probe. The process concludes with the selection of positive colonies and sequencing. The image is labeled with various DNA strands, demonstrating the 5' to 3' orientation of DNA replication. The entire process is clearly outlined in a sequence of steps, with a caption reading "Figure 1: Schematic representation of traditional method of development of species-specific microsatellite markers". The main color scheme of the image is white, with textual elements and DNA strands highlighted in different colors for differentiation. Interestingly, a fish is also detected in the image, although its relevance to the depicted process is unclear without further context. The image serves as an educational tool, likely used in scientific presentations or textbooks to explain complex genetic processes in an easy-to-understand format.

# Conclusions

- AI ought to be great for generating Alt-Text, but it has some problems
  - Can create, short captions for images however, do they really fit the criteria established by WebAIM.org?
    - Simplistic images are likely suitable for AI generated alt-text
    - Complex images not suitable for AI generated alt-text
- Is Alt-Text the best tool for ensuring accessibility?
  - WebAIM.org conclude that alt-text is a significant issue that affects web accessibility, and that “divergent” approaches have been used. One of these is `<figcaption>` that is used with `<img>` within the `<figure>` element in HTML.
  - `<figcaption>` can be detailed, allowing the alt-text to remain succinct and appropriate.

```
<figure>  
    
  <figcaption>An elephant at sunset</figcaption>  
</figure>
```
  - In other words, multiple approaches should be used to ensure web accessibility

# Conclusions

- Alt-text and Figcaption in context of the targeted readership
  - English law uses the example of the “Man on the Clapham Omnibus”
    - Reasonably educated, intelligent, but non-descript.
  - Would most uses of Alt-text generated by AI be sufficient in this case?
  - Do scientific publications rise beyond this type of person?
    - In which case, is AI alt-text sufficient
  - Most scientific articles don’t fully describe images in the narratives
    - Images are a tool for interpreting data to highlight conclusions made by the author.
  - What about peer-reviewers who require alt-text?

