Advantages of References

• Optimize memory usage

• Allows many array or hash inputs for subroutines.

• Create complex “data structures”
Data structure

- A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently.

- Example, an ATOM:

```php
$atoms = {
    'name'  => ' CA ',
    'number' => 1,
    'coord' => [ 0.0  1.0  -1.0 ]
};
```
Amino acid

```php
$amino = {
    'name' => 'ALA',
    'number' => 1,
    'atoms' => [ $atm1, $atm2 ...
    ]
};
```

Protein chain

```php
$chain = {
    'id' => 'A',
    'aminos' => [$amin1, $amin2, ...
    ]
};
```