

===== REPEAT 1/5 =====

Starting 5-fold CV (3-train / 1-val / 1-test) on 398 samples...

===== Outer Fold 1 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

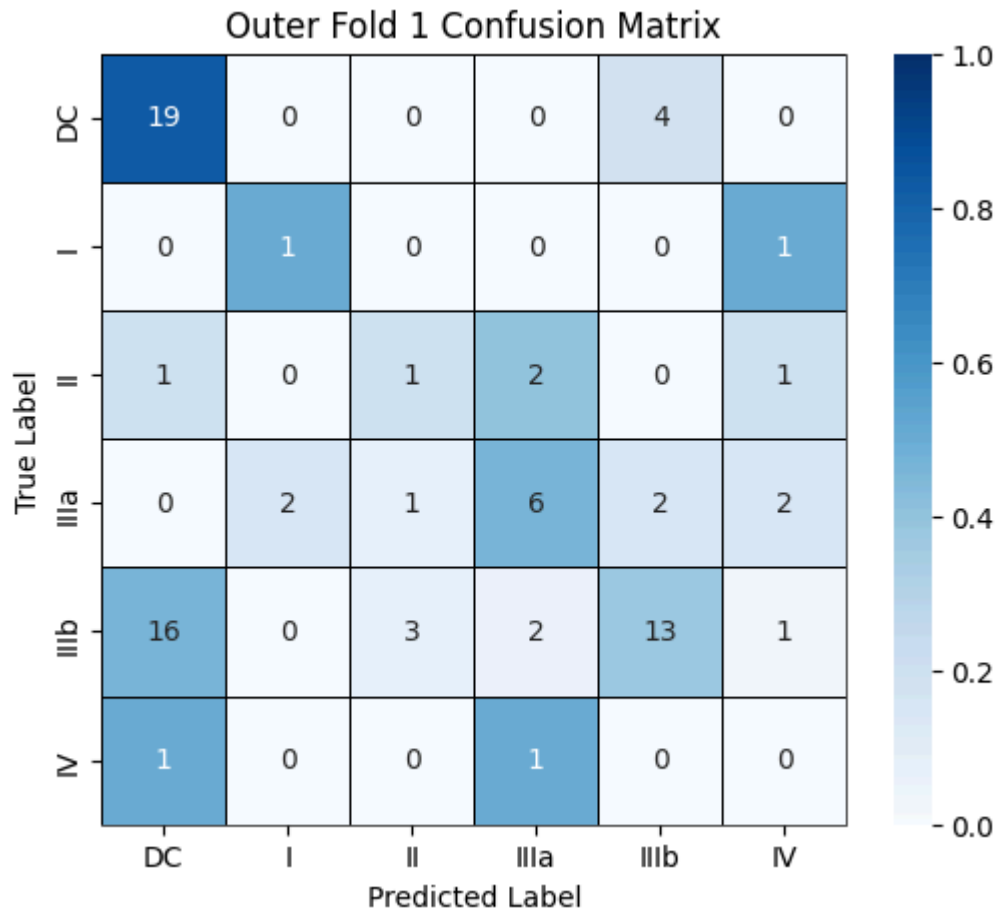
DC	0.5135	0.8261	0.6333	23
I	0.3333	0.5000	0.4000	2
II	0.2000	0.2000	0.2000	5
IIIa	0.5455	0.4615	0.5000	13
IIIb	0.6842	0.3714	0.4815	35
IV	0.0000	0.0000	0.0000	2

accuracy			0.5000	80
macro avg	0.3794	0.3932	0.3691	80
weighted avg	0.5564	0.5000	0.4965	80

Balanced Accuracy: 0.39317566491479533

Confusion Matrix:

```
[[19 0 0 0 4 0]
 [0 1 0 0 0 1]
 [1 0 1 2 0 1]
 [0 2 1 6 2 2]
 [16 0 3 2 13 1]
 [1 0 0 1 0 0]]
```



===== Outer Fold 2 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.7333	0.9565	0.8302	23
I	0.2500	0.6667	0.3636	3
II	0.2500	0.2000	0.2222	5
IIIa	0.2941	0.4167	0.3448	12
IIIb	0.7368	0.4000	0.5185	35
IV	0.5000	0.5000	0.5000	2

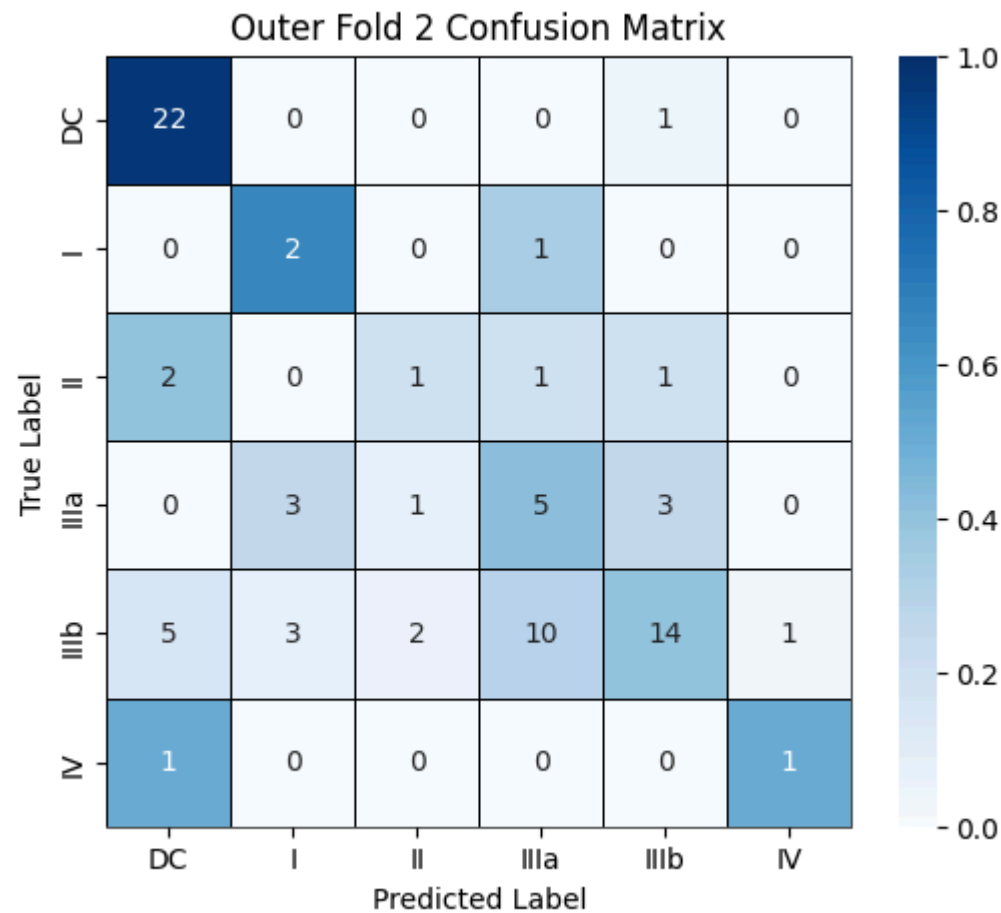
accuracy		0.5625		80
macro avg	0.4607	0.5233	0.4632	80
weighted avg	0.6148	0.5625	0.5573	80

Balanced Accuracy: 0.5233091787439613

Confusion Matrix:

```
[[22 0 0 0 1 0]
 [0 2 0 1 0 0]
 [2 0 1 1 1 0]
 [0 3 1 5 3 0]]
```

[5 3 2 10 14 1]
[1 0 0 0 0 1]]



===== Outer Fold 3 =====

These features will be dropped:

['C11', 'C101', 'MC6. DP T cells', 'C64', 'C100', 'C126', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

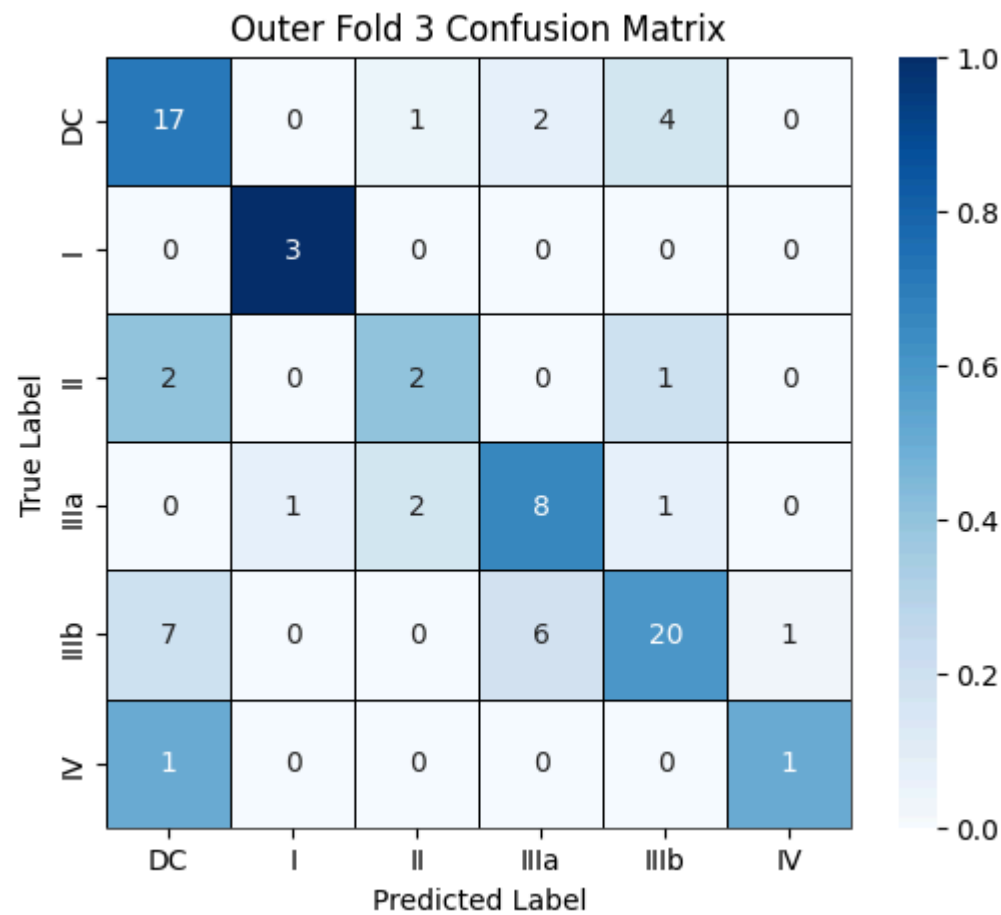
	precision	recall	f1-score	support
DC	0.6296	0.7083	0.6667	24
I	0.7500	1.0000	0.8571	3
II	0.4000	0.4000	0.4000	5
IIIa	0.5000	0.6667	0.5714	12
IIIb	0.7692	0.5882	0.6667	34
IV	0.5000	0.5000	0.5000	2
accuracy	0.6375		80	
macro avg	0.5915	0.6439	0.6103	80
weighted avg	0.6564	0.6375	0.6387	80

Balanced Accuracy: 0.6438725490196079

Confusion Matrix:

[[17 0 1 2 4 0]

```
[0 3 0 0 0 0]
[2 0 2 0 1 0]
[0 1 2 8 1 0]
[7 0 0 6 20 1]
[1 0 0 0 0 1]]
```



===== Outer Fold 4 =====

These features will be dropped:

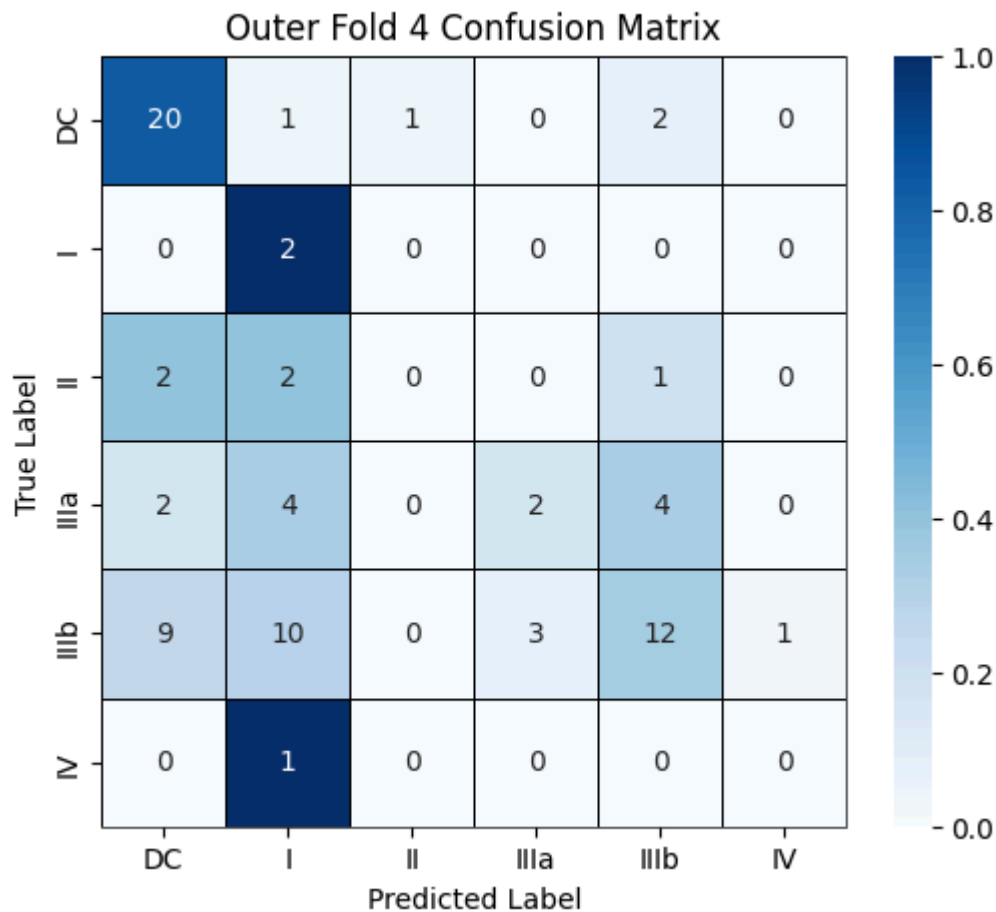
['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

	precision	recall	f1-score	support
DC	0.6061	0.8333	0.7018	24
I	0.1000	1.0000	0.1818	2
II	0.0000	0.0000	0.0000	5
IIIa	0.4000	0.1667	0.2353	12
IIIb	0.6316	0.3429	0.4444	35
IV	0.0000	0.0000	0.0000	1
accuracy		0.4557		79
macro avg	0.2896	0.3905	0.2606	79
weighted avg	0.5272	0.4557	0.4504	79

Balanced Accuracy: 0.3904761904761905

Confusion Matrix:

```
[[20 1 1 0 2 0]
 [ 0 2 0 0 0 0]
 [ 2 2 0 0 1 0]
 [ 2 4 0 2 4 0]
 [ 9 10 0 3 12 1]
 [ 0 1 0 0 0 0]]
```



===== Outer Fold 5 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6111	0.9167	0.7333	24
I	0.3333	0.5000	0.4000	2
II	0.3333	0.2500	0.2857	4
IIIa	0.6250	0.8333	0.7143	12
IIIb	0.8421	0.4571	0.5926	35
IV	0.5000	0.5000	0.5000	2

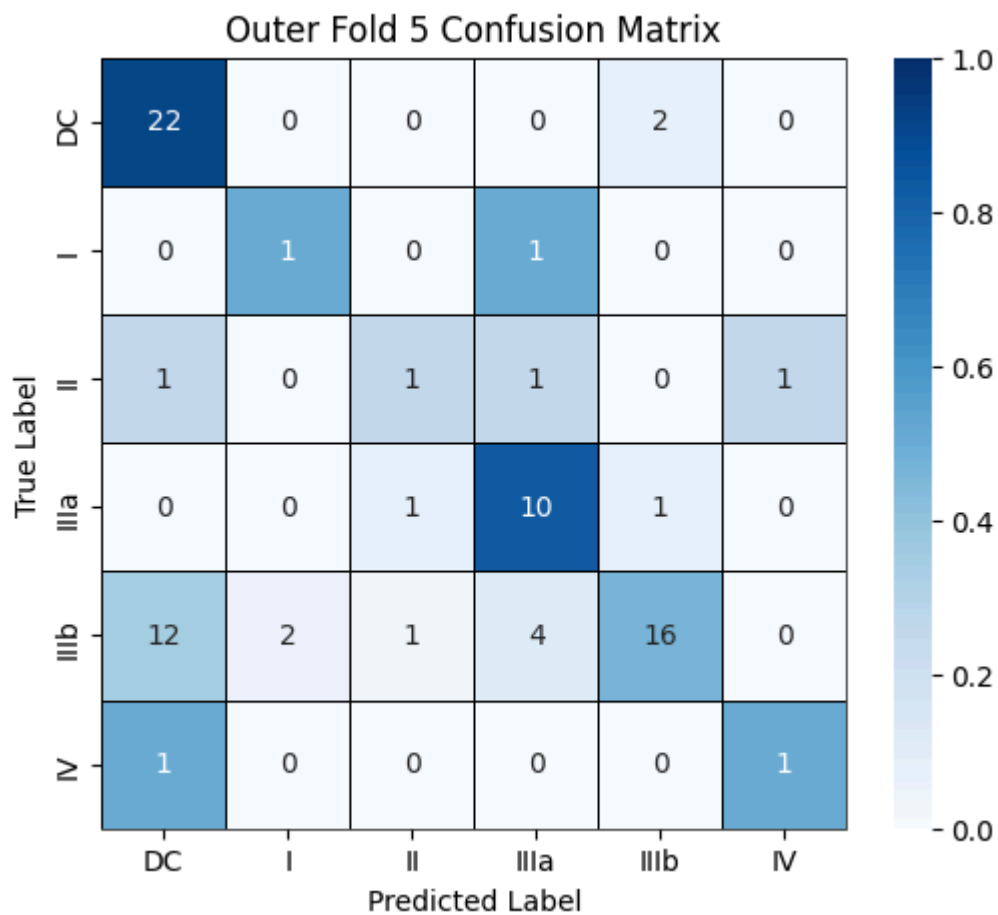
accuracy 0.6456 79

macro avg 0.5408 0.5762 0.5377 79
 weighted avg 0.6917 0.6456 0.6311 79

Balanced Accuracy: 0.5761904761904763

Confusion Matrix:

```
[[22 0 0 0 2 0]
 [0 1 0 1 0 0]
 [1 0 1 1 0 1]
 [0 0 1 10 1 0]
 [12 2 1 4 16 0]
 [1 0 0 0 0 1]]
```



===== CV SUMMARY =====

precision recall f1-score support

```
DC 0.6135 0.8475 0.7117 118
 I 0.2368 0.7500 0.3600 12
 II 0.2778 0.2083 0.2381 24
 IIIa 0.4769 0.5082 0.4921 61
 IIIb 0.7353 0.4310 0.5435 174
 IV 0.2500 0.3333 0.2857 9
```

accuracy 0.5603 398

```

macro avg  0.4317  0.5131  0.4385   398
weighted avg  0.6060  0.5603  0.5557   398

```

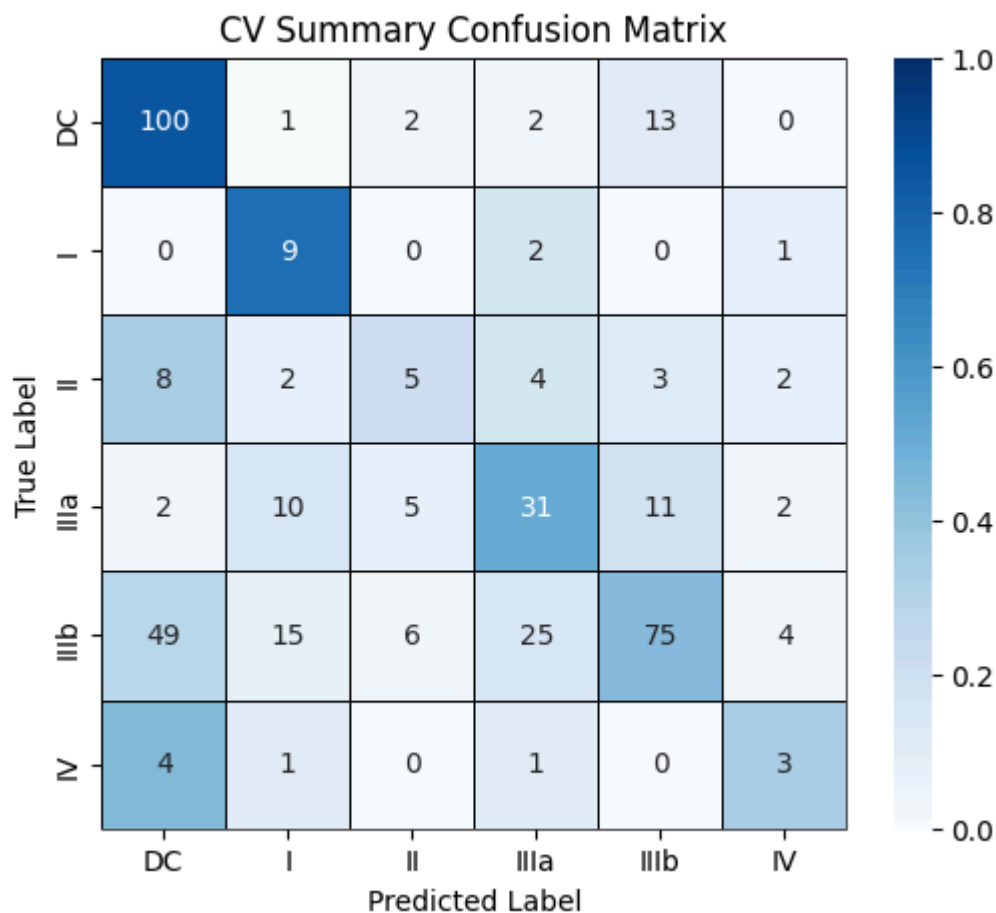
Balanced Accuracy: 0.5130592496425678

Confusion Matrix:

```

[[100  1  2  2 13  0]
 [ 0  9  0  2  0  1]
 [ 8  2  5  4  3  2]
 [ 2 10  5 31 11  2]
 [49 15  6 25 75  4]
 [ 4  1  0  1  0  3]]

```



===== REPEAT 2/5 =====

Starting 5-fold CV (3-train / 1-val / 1-test) on 398 samples...

===== Outer Fold 1 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

```

DC  0.5429  0.8261  0.6552   23
I   0.5000  0.5000  0.5000    2

```

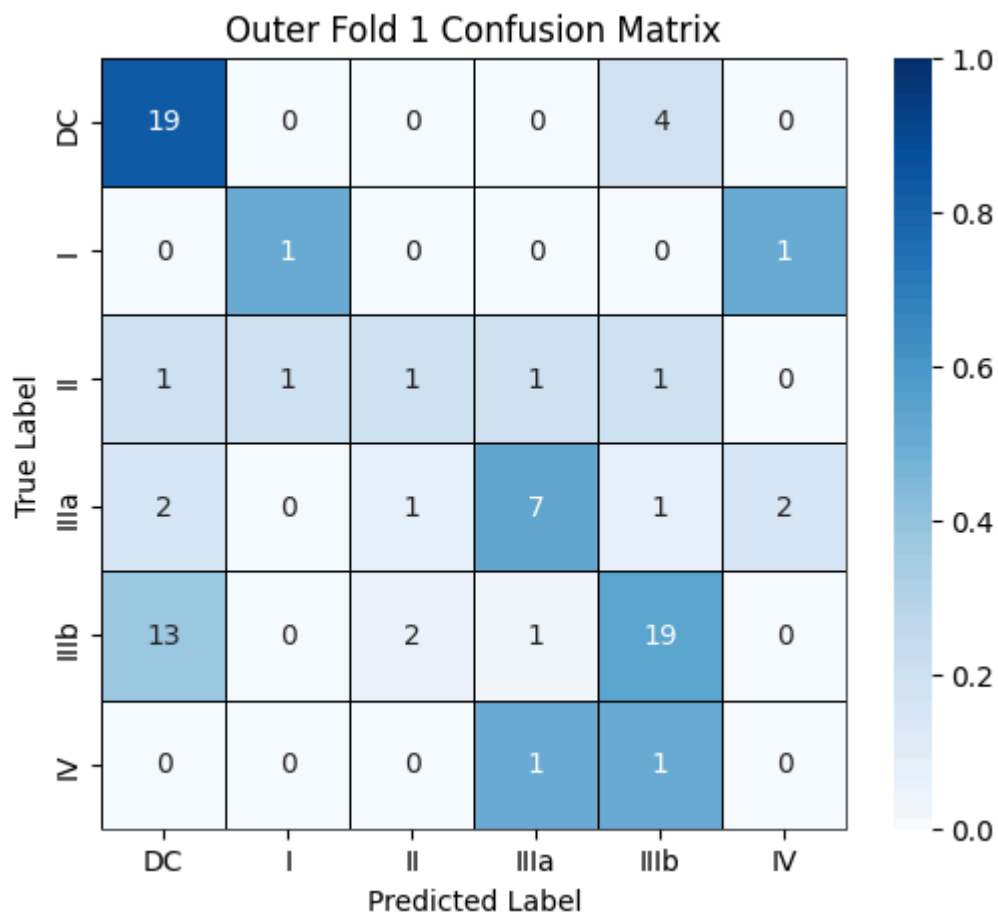
II	0.2500	0.2000	0.2222	5
IIIa	0.7000	0.5385	0.6087	13
IIIb	0.7308	0.5429	0.6230	35
IV	0.0000	0.0000	0.0000	2

accuracy		0.5875	80
macro avg	0.4539	0.4346	0.4348
weighted avg	0.6177	0.5875	0.5862

Balanced Accuracy: 0.43456760630673674

Confusion Matrix:

```
[[19 0 0 0 4 0]
 [ 0 1 0 0 0 1]
 [ 1 1 1 1 1 0]
 [ 2 0 1 7 1 2]
 [13 0 2 1 19 0]
 [ 0 0 0 1 1 0]]
```



===== Outer Fold 2 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

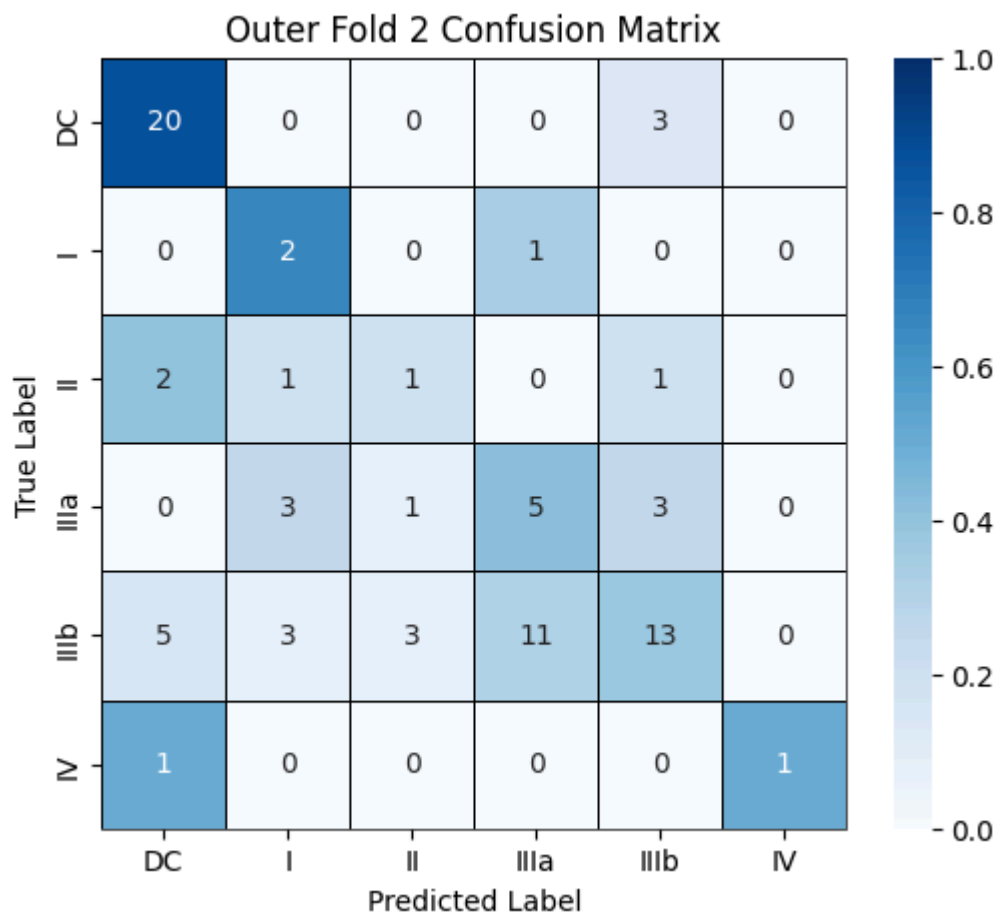
DC	0.7143	0.8696	0.7843	23
I	0.2222	0.6667	0.3333	3
II	0.2000	0.2000	0.2000	5
IIIa	0.2941	0.4167	0.3448	12
IIIb	0.6500	0.3714	0.4727	35
IV	1.0000	0.5000	0.6667	2

accuracy		0.5250	80
macro avg	0.5134	0.5041	0.4670
weighted avg	0.5797	0.5250	0.5257

Balanced Accuracy: 0.5040545203588681

Confusion Matrix:

```
[[20 0 0 0 3 0]
 [ 0 2 0 1 0 0]
 [ 2 1 1 0 1 0]
 [ 0 3 1 5 3 0]
 [ 5 3 3 11 13 0]
 [ 1 0 0 0 0 1]]
```



===== Outer Fold 3 =====

These features will be dropped:

['C11', 'C101', 'MC6. DP T cells', 'C64', 'C100', 'C126', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

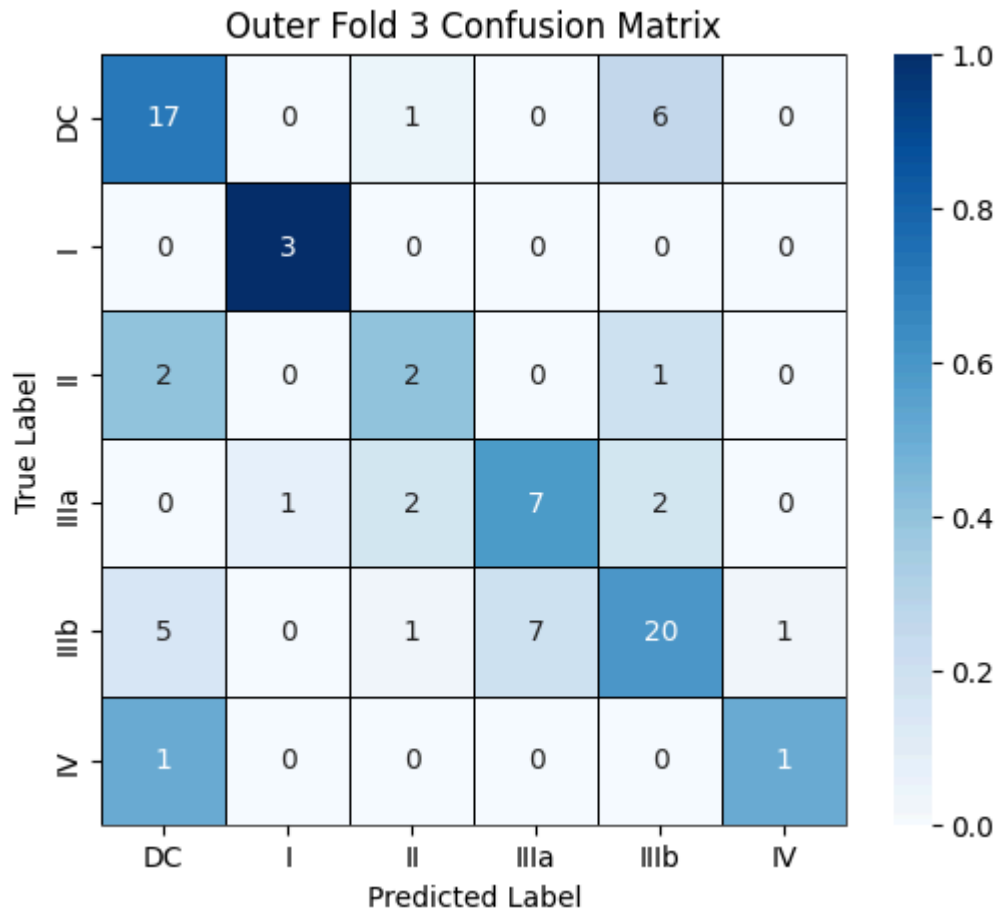
DC	0.6800	0.7083	0.6939	24
I	0.7500	1.0000	0.8571	3
II	0.3333	0.4000	0.3636	5
IIIa	0.5000	0.5833	0.5385	12
IIIb	0.6897	0.5882	0.6349	34
IV	0.5000	0.5000	0.5000	2

accuracy			0.6250	80
macro avg	0.5755	0.6300	0.5980	80
weighted avg	0.6336	0.6250	0.6261	80

Balanced Accuracy: 0.629983660130719

Confusion Matrix:

```
[[17 0 1 0 6 0]
 [0 3 0 0 0 0]
 [2 0 2 0 1 0]
 [0 1 2 7 2 0]
 [5 0 1 7 20 1]
 [1 0 0 0 0 1]]
```



===== Outer Fold 4 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6296	0.7083	0.6667	24
I	0.2500	1.0000	0.4000	2
II	0.2143	0.6000	0.3158	5
IIIa	0.5000	0.5000	0.5000	12
IIIb	0.7692	0.2857	0.4167	35
IV	0.0000	0.0000	0.0000	1

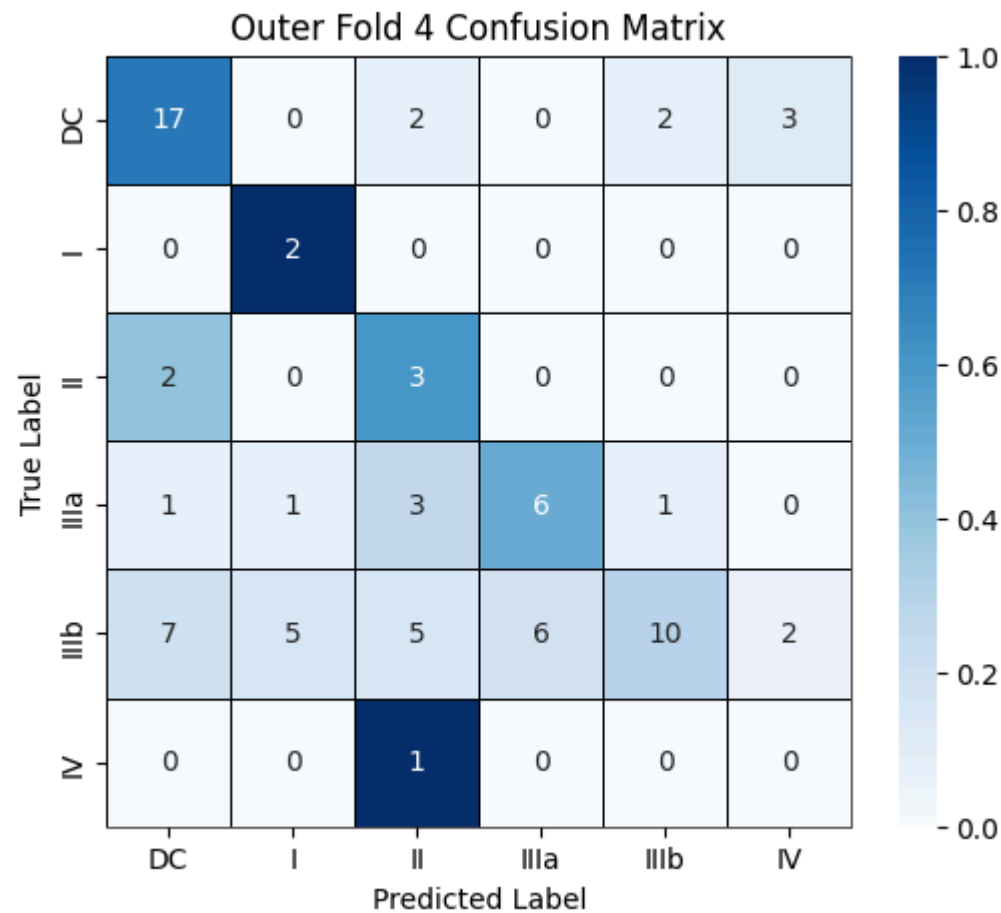
accuracy		0.4810		79
macro avg	0.3939	0.5157	0.3832	79
weighted avg	0.6279	0.4810	0.4932	79

Balanced Accuracy: 0.5156746031746032

Confusion Matrix:

```
[[17 0 2 0 2 3]
 [0 2 0 0 0 0]
 [2 0 3 0 0 0]
 [1 1 3 6 1 0]]
```

[7 5 5 6 10 2]
[0 0 1 0 0 0]]



===== Outer Fold 5 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

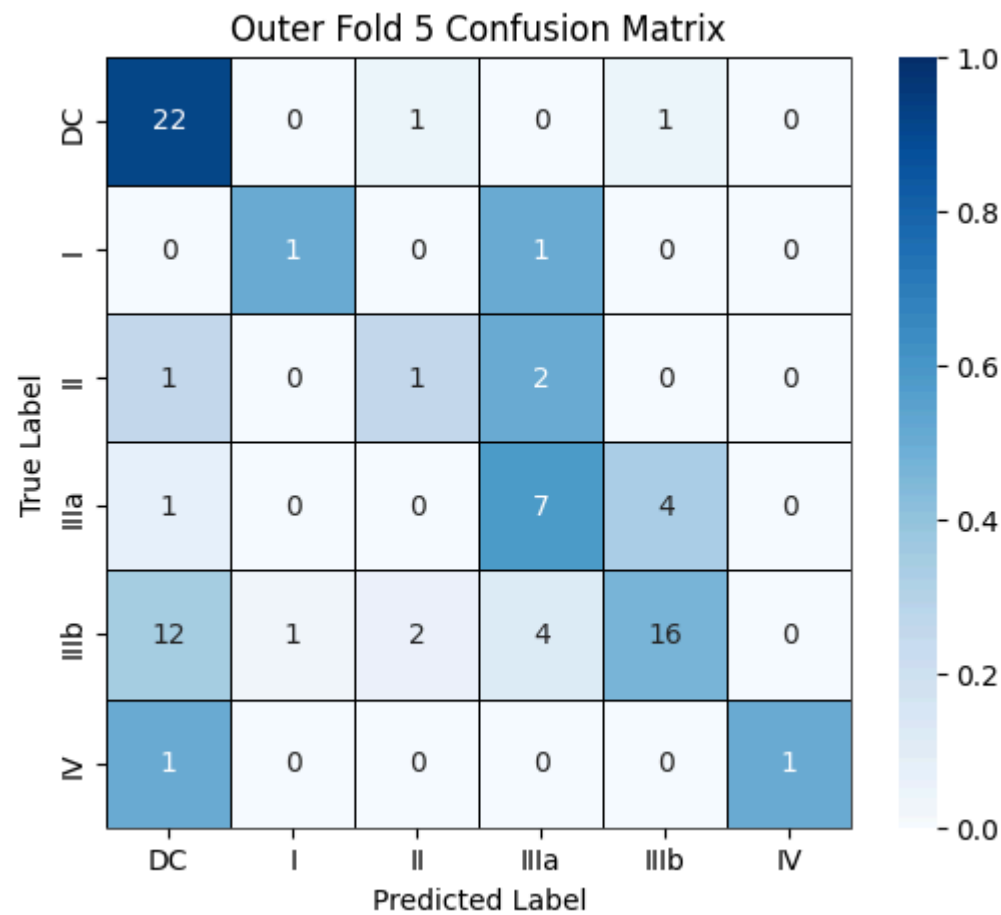
	precision	recall	f1-score	support
DC	0.5946	0.9167	0.7213	24
I	0.5000	0.5000	0.5000	2
II	0.2500	0.2500	0.2500	4
IIIa	0.5000	0.5833	0.5385	12
IIIb	0.7619	0.4571	0.5714	35
IV	1.0000	0.5000	0.6667	2
accuracy	0.6076		79	
macro avg	0.6011	0.5345	0.5413	79
weighted avg	0.6448	0.6076	0.5963	79

Balanced Accuracy: 0.5345238095238095

Confusion Matrix:

[[22 0 1 0 1 0]

```
[0 1 0 1 0 0]
[1 0 1 2 0 0]
[1 0 0 7 4 0]
[12 1 2 4 16 0]
[1 0 0 0 0 1]]
```



===== CV SUMMARY =====

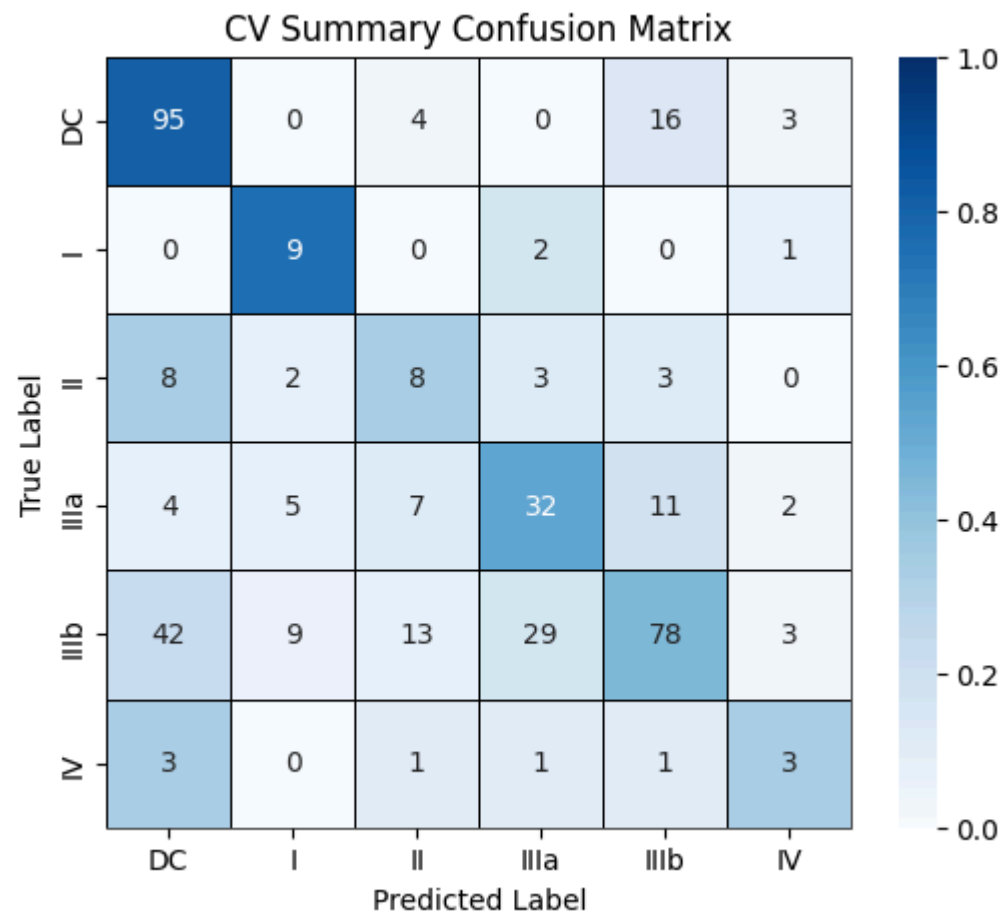
	precision	recall	f1-score	support
DC	0.6250	0.8051	0.7037	118
I	0.3600	0.7500	0.4865	12
II	0.2424	0.3333	0.2807	24
IIIa	0.4776	0.5246	0.5000	61
IIIb	0.7156	0.4483	0.5512	174
IV	0.2500	0.3333	0.2857	9
accuracy		0.5653		398
macro avg	0.4451	0.5324	0.4680	398
weighted avg	0.6025	0.5653	0.5643	398

Balanced Accuracy: 0.5324362397387951

Confusion Matrix:

```
[[95 0 4 0 16 3]
```

```
[0 9 0 2 0 1]
[8 2 8 3 3 0]
[4 5 7 32 11 2]
[42 9 13 29 78 3]
[3 0 1 1 1 3]]
```



===== REPEAT 3/5 =====

Starting 5-fold CV (3-train / 1-val / 1-test) on 398 samples...

===== Outer Fold 1 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.5556	0.6522	0.6000	23
I	0.5000	0.5000	0.5000	2
II	0.2000	0.2000	0.2000	5
IIIa	0.5500	0.8462	0.6667	13
IIIb	0.7500	0.5143	0.6102	35
IV	0.5000	0.5000	0.5000	2

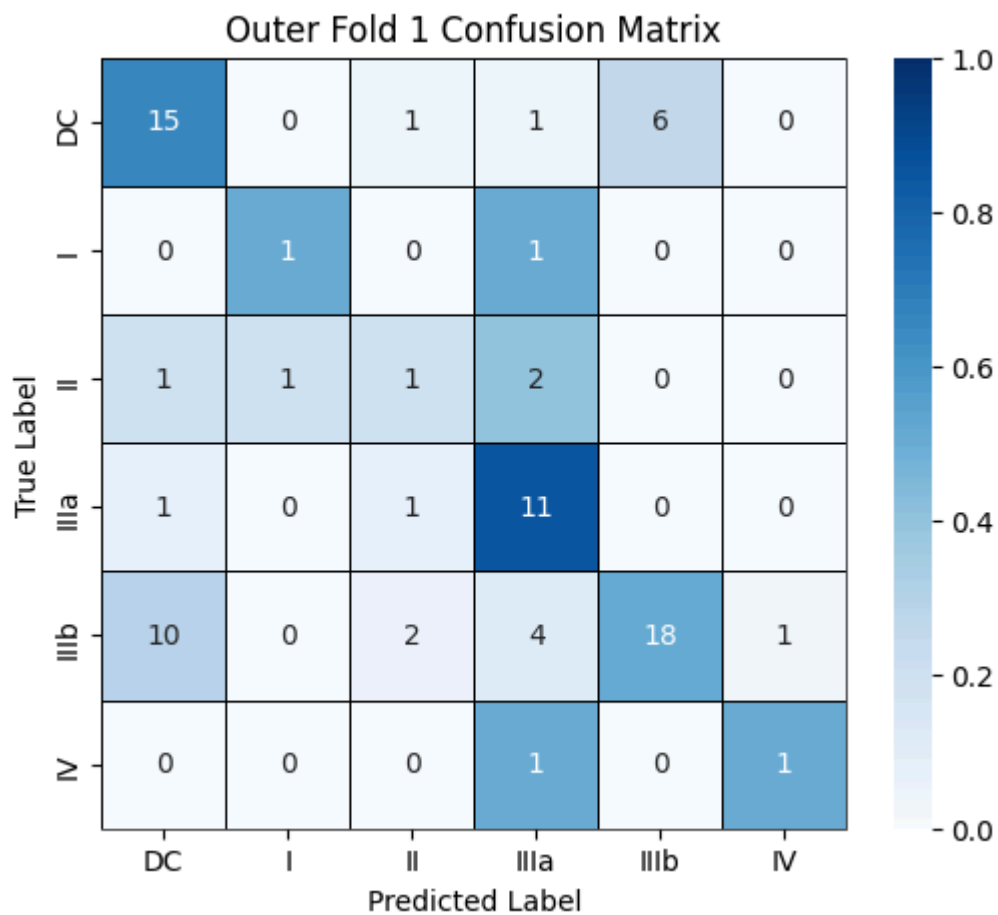
accuracy 0.5875 80

macro avg 0.5093 0.5354 0.5128 80
weighted avg 0.6147 0.5875 0.5853 80

Balanced Accuracy: 0.5354355789138397

Confusion Matrix:

```
[[15 0 1 1 6 0]
 [0 1 0 1 0 0]
 [1 1 1 2 0 0]
 [1 0 1 11 0 0]
 [10 0 2 4 18 1]
 [0 0 0 1 0 1]]
```



===== Outer Fold 2 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6765	1.0000	0.8070	23
I	0.3333	0.6667	0.4444	3
II	0.3333	0.4000	0.3636	5
IIIa	0.3158	0.5000	0.3871	12
IIIb	0.7143	0.2857	0.4082	35

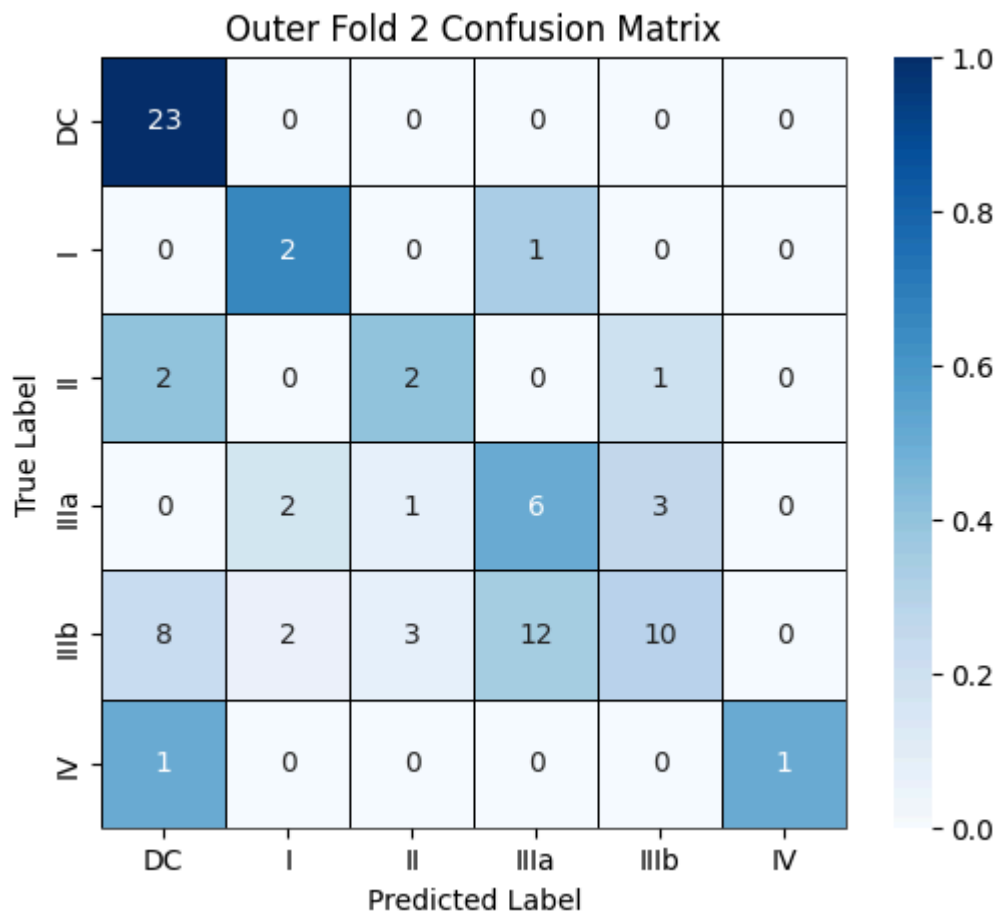
IV	1.0000	0.5000	0.6667	2
----	--------	--------	--------	---

accuracy		0.5500	80	
macro avg	0.5622	0.5587	0.5128	80
weighted avg	0.6127	0.5500	0.5247	80

Balanced Accuracy: 0.5587301587301586

Confusion Matrix:

```
[[23 0 0 0 0 0]
 [0 2 0 1 0 0]
 [2 0 2 0 1 0]
 [0 2 1 6 3 0]
 [8 2 3 12 10 0]
 [1 0 0 0 0 1]]
```



===== Outer Fold 3 =====

These features will be dropped:

['C11', 'C101', 'MC6. DP T cells', 'C64', 'C100', 'C126', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

	precision	recall	f1-score	support
--	-----------	--------	----------	---------

DC	0.6452	0.8333	0.7273	24
I	0.5000	1.0000	0.6667	3

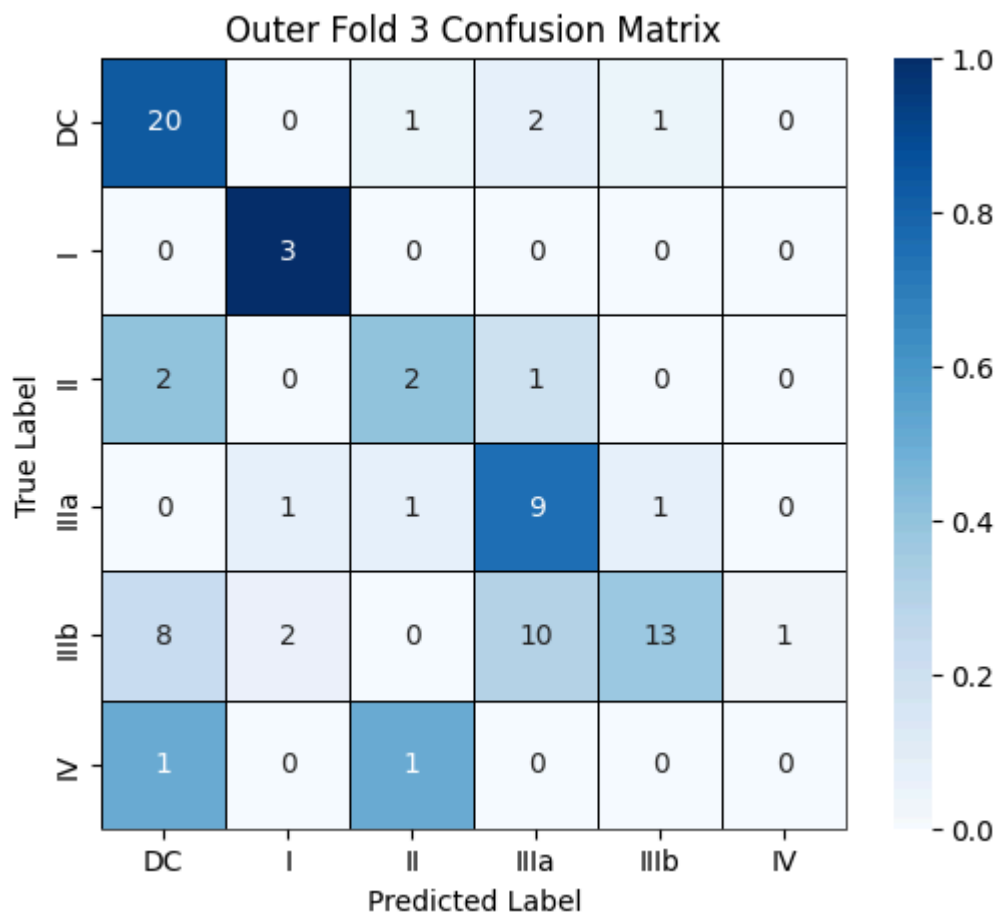
II	0.4000	0.4000	0.4000	5
IIIa	0.4091	0.7500	0.5294	12
IIIb	0.8667	0.3824	0.5306	34
IV	0.0000	0.0000	0.0000	2

accuracy		0.5875	80
macro avg	0.4702	0.5609	0.4757
weighted avg	0.6670	0.5875	0.5731

Balanced Accuracy: 0.5609477124183007

Confusion Matrix:

```
[[20 0 1 2 1 0]
 [ 0 3 0 0 0 0]
 [ 2 0 2 1 0 0]
 [ 0 1 1 9 1 0]
 [ 8 2 0 10 13 1]
 [ 1 0 1 0 0 0]]
```



===== Outer Fold 4 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

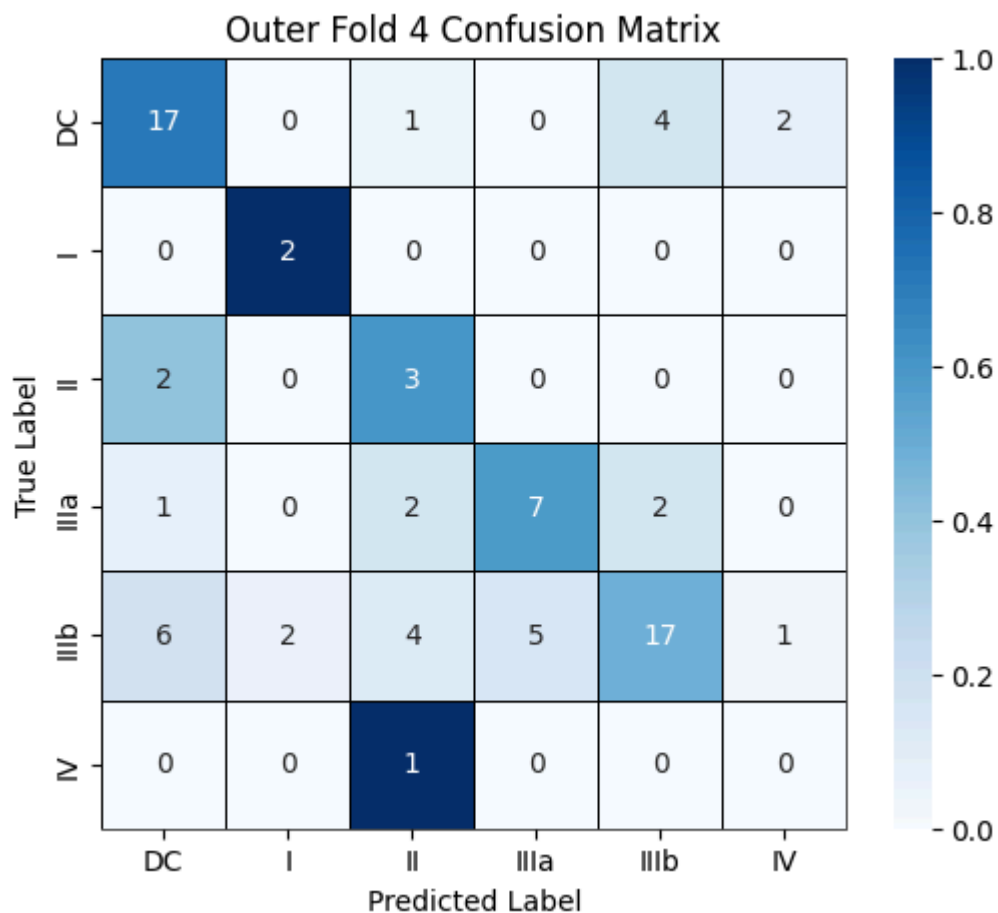
DC	0.6538	0.7083	0.6800	24
I	0.5000	1.0000	0.6667	2
II	0.2727	0.6000	0.3750	5
IIIa	0.5833	0.5833	0.5833	12
IIIb	0.7391	0.4857	0.5862	35
IV	0.0000	0.0000	0.0000	1

accuracy		0.5823	79
macro avg	0.4582	0.5629	0.4819
weighted avg	0.6446	0.5823	0.5955

Balanced Accuracy: 0.5628968253968255

Confusion Matrix:

```
[[17 0 1 0 4 2]
 [ 0 2 0 0 0 0]
 [ 2 0 3 0 0 0]
 [ 1 0 2 7 2 0]
 [ 6 2 4 5 17 1]
 [ 0 0 1 0 0 0]]
```



===== Outer Fold 5 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

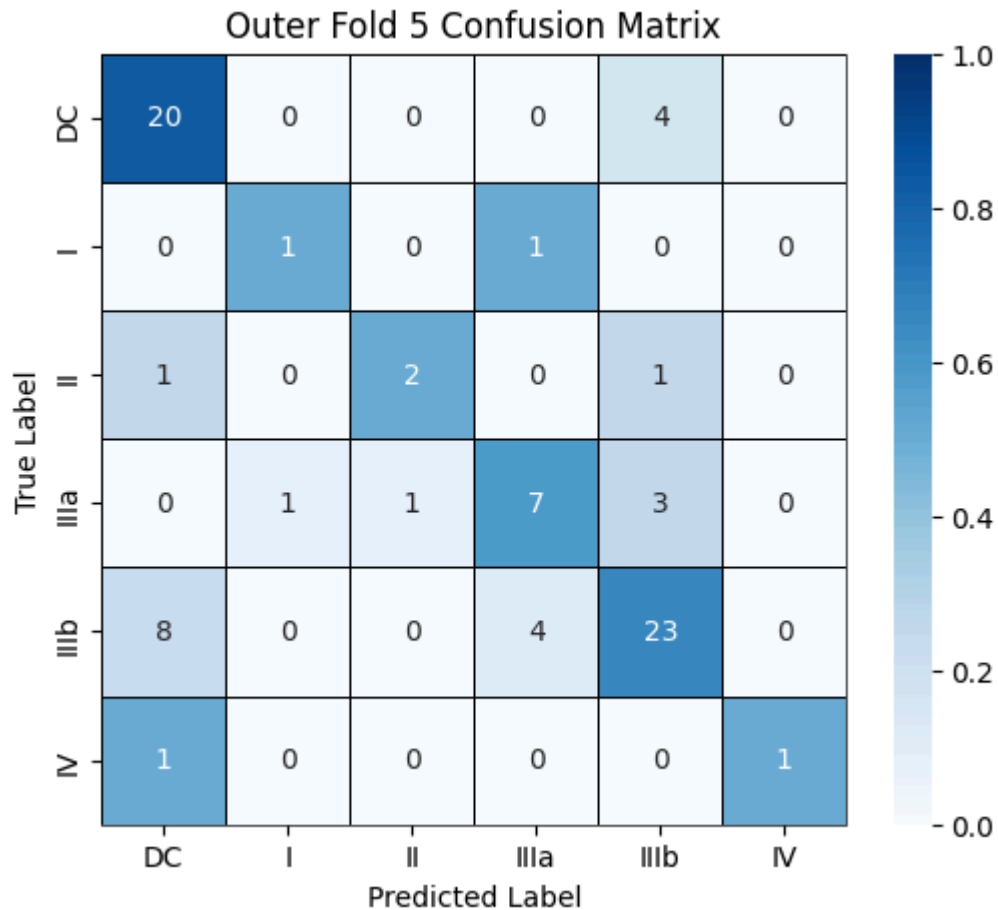
DC	0.6667	0.8333	0.7407	24
I	0.5000	0.5000	0.5000	2
II	0.6667	0.5000	0.5714	4
IIIa	0.5833	0.5833	0.5833	12
IIIb	0.7419	0.6571	0.6970	35
IV	1.0000	0.5000	0.6667	2

accuracy			0.6835	79
macro avg	0.6931	0.5956	0.6265	79
weighted avg	0.6916	0.6835	0.6809	79

Balanced Accuracy: 0.5956349206349206

Confusion Matrix:

```
[[20 0 0 0 4 0]
 [ 0 1 0 1 0 0]
 [ 1 0 2 0 1 0]
 [ 0 1 1 7 3 0]
 [ 8 0 0 4 23 0]
 [ 1 0 0 0 0 1]]
```



===== CV SUMMARY =====

precision recall f1-score support

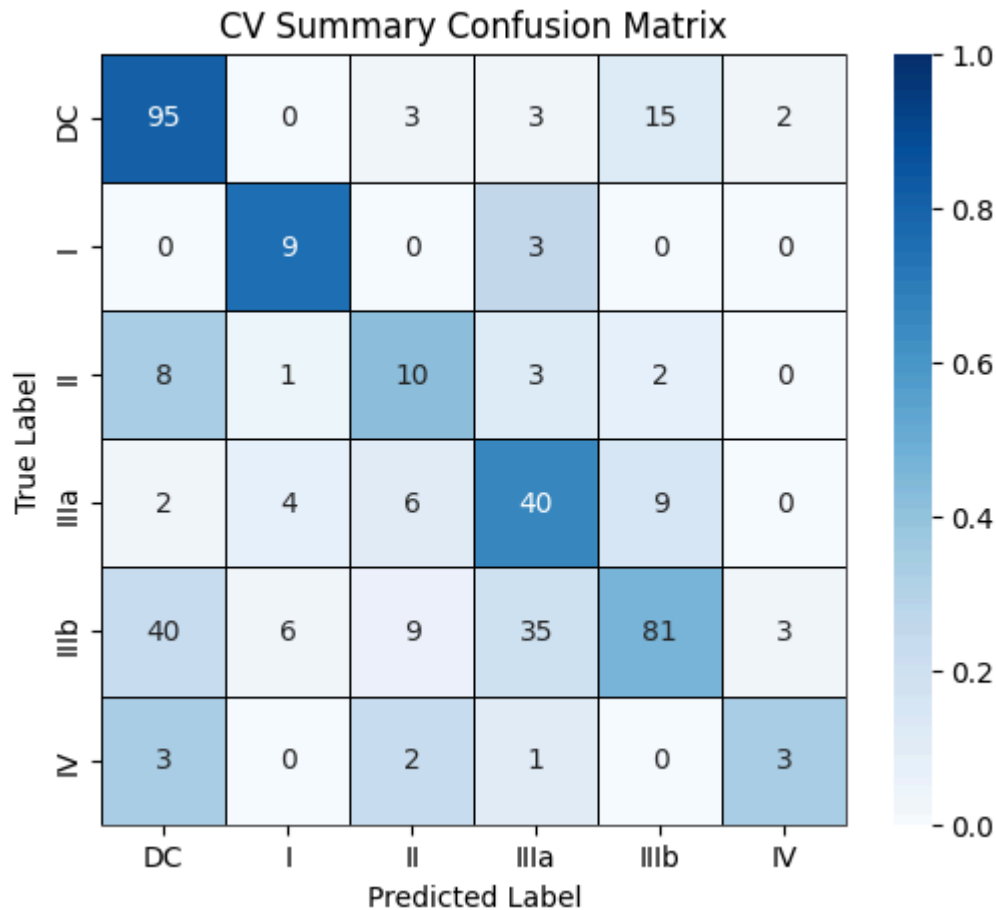
DC	0.6419	0.8051	0.7143	118
I	0.4500	0.7500	0.5625	12
II	0.3333	0.4167	0.3704	24
IIIa	0.4706	0.6557	0.5479	61
IIIb	0.7570	0.4655	0.5765	174
IV	0.3750	0.3333	0.3529	9

accuracy		0.5980	398
macro avg	0.5046	0.5711	0.5208
weighted avg	0.6355	0.5980	0.5951

Balanced Accuracy: 0.5710566153433426

Confusion Matrix:

```
[[95 0 3 3 15 2]
 [0 9 0 3 0 0]
 [8 1 10 3 2 0]
 [2 4 6 40 9 0]
 [40 6 9 35 81 3]
 [3 0 2 1 0 3]]
```



===== REPEAT 4/5 =====

Starting 5-fold CV (3-train / 1-val / 1-test) on 398 samples...

===== Outer Fold 1 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.5455	0.7826	0.6429	23
I	1.0000	0.5000	0.6667	2
II	0.4000	0.4000	0.4000	5
IIIa	0.5882	0.7692	0.6667	13
IIIb	0.7143	0.4286	0.5357	35
IV	0.0000	0.0000	0.0000	2

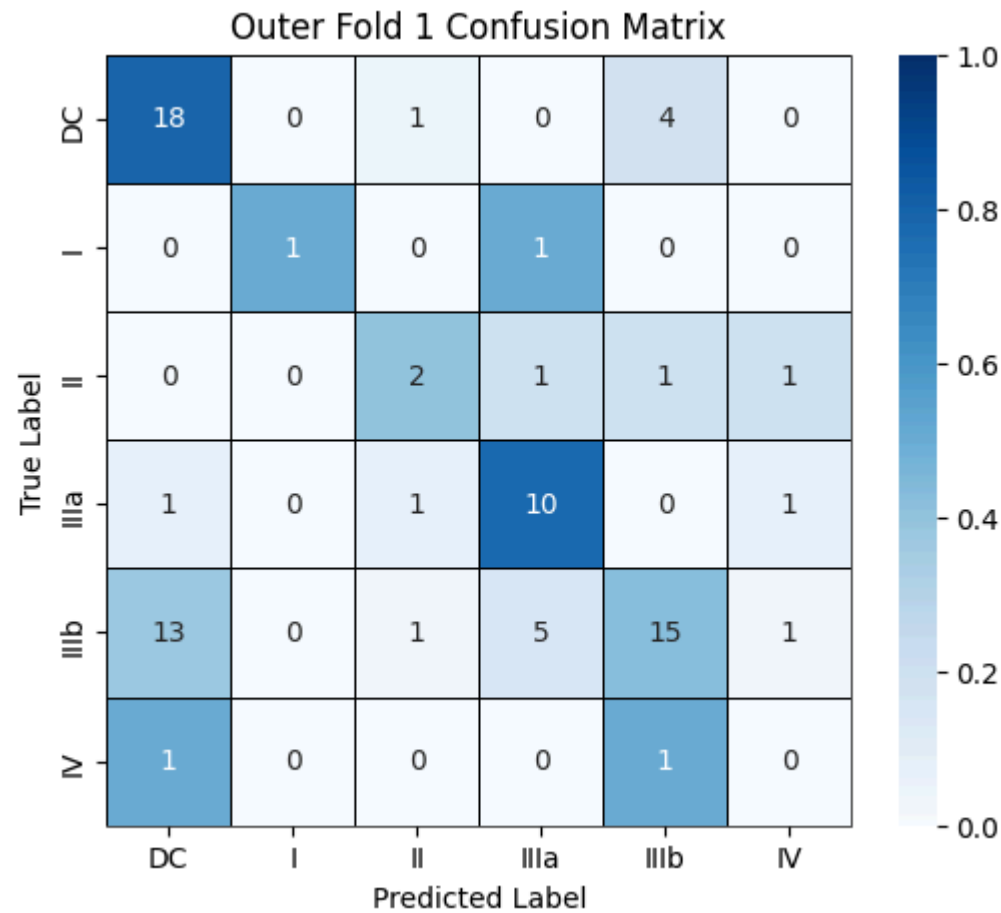
accuracy		0.5750	80
macro avg	0.5413	0.4801	0.4853
weighted avg	0.6149	0.5750	0.5692

Balanced Accuracy: 0.48006848224239523

Confusion Matrix:

[[18 0 1 0 4 0]

```
[0 1 0 1 0 0]
[0 0 2 1 1 1]
[1 0 1 10 0 1]
[13 0 1 5 15 1]
[1 0 0 0 1 0]]
```



===== Outer Fold 2 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'C127', 'C51', 'C135', 'C66']

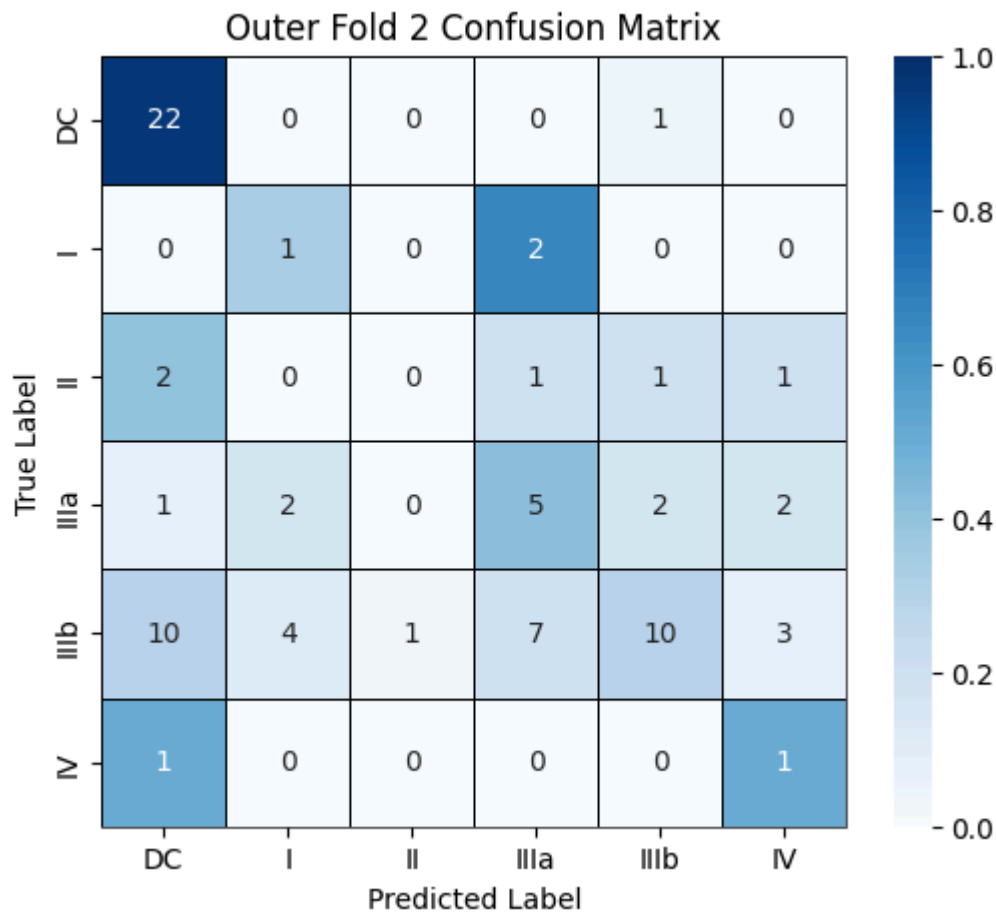
	precision	recall	f1-score	support
DC	0.6111	0.9565	0.7458	23
I	0.1429	0.3333	0.2000	3
II	0.0000	0.0000	0.0000	5
IIIa	0.3333	0.4167	0.3704	12
IIIb	0.7143	0.2857	0.4082	35
IV	0.1429	0.5000	0.2222	2

accuracy		0.4875	80	
macro avg	0.3241	0.4154	0.3244	80
weighted avg	0.5471	0.4875	0.4616	80

Balanced Accuracy: 0.41537267080745344

Confusion Matrix:

```
[[22 0 0 0 1 0]
 [ 0 1 0 2 0 0]
 [ 2 0 0 1 1 1]
 [ 1 2 0 5 2 2]
 [10 4 1 7 10 3]
 [ 1 0 0 0 0 1]]
```



===== Outer Fold 3 =====

These features will be dropped:

['C11', 'C101', 'MC6. DP T cells', 'C64', 'C100', 'C126', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6250	0.8333	0.7143	24
I	0.5000	1.0000	0.6667	3
II	0.2500	0.4000	0.3077	5
IIIa	0.4375	0.5833	0.5000	12
IIIb	0.7500	0.3529	0.4800	34
IV	0.0000	0.0000	0.0000	2

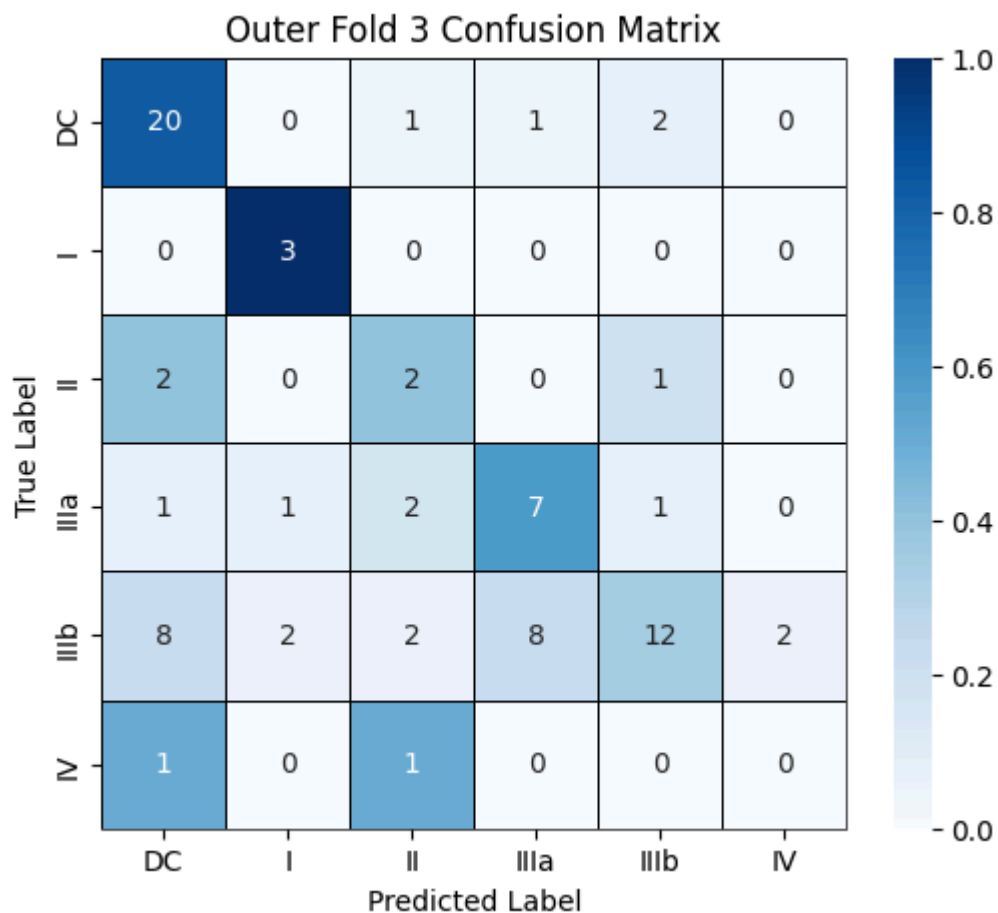
accuracy 0.5500 80

macro avg 0.4271 0.5283 0.4448 80
 weighted avg 0.6062 0.5500 0.5375 80

Balanced Accuracy: 0.5282679738562092

Confusion Matrix:

```
[[20 0 1 1 2 0]
 [0 3 0 0 0 0]
 [2 0 2 0 1 0]
 [1 1 2 7 1 0]
 [8 2 2 8 12 2]
 [1 0 1 0 0 0]]
```



===== Outer Fold 4 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.5926	0.6667	0.6275	24
I	0.2222	1.0000	0.3636	2
II	0.1667	0.4000	0.2353	5
IIIa	0.5000	0.4167	0.4545	12
IIIb	0.8421	0.4571	0.5926	35

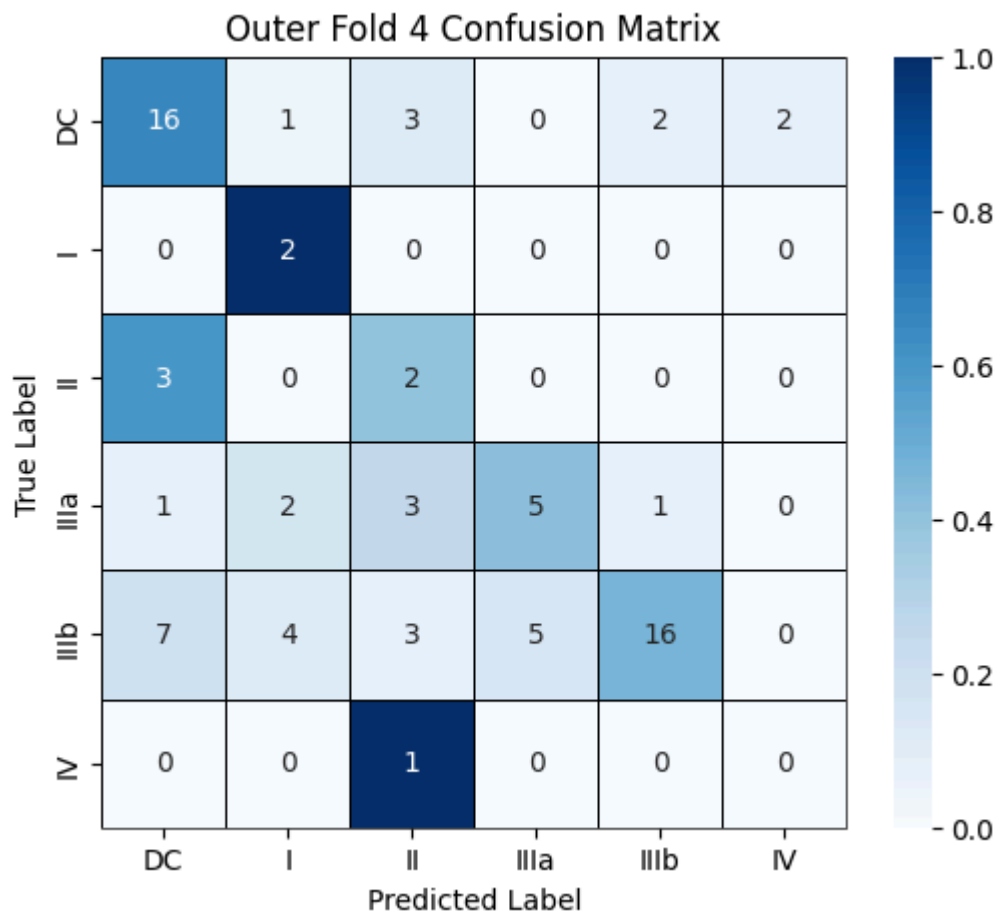
IV	0.0000	0.0000	0.0000	1
----	--------	--------	--------	---

accuracy		0.5190	79	
macro avg	0.3873	0.4901	0.3789	79
weighted avg	0.6452	0.5190	0.5463	79

Balanced Accuracy: 0.49007936507936506

Confusion Matrix:

```
[[16 1 3 0 2 2]
 [0 2 0 0 0 0]
 [3 0 2 0 0 0]
 [1 2 3 5 1 0]
 [7 4 3 5 16 0]
 [0 0 1 0 0 0]]
```



===== Outer Fold 5 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

	precision	recall	f1-score	support
--	-----------	--------	----------	---------

DC	0.6667	0.8333	0.7407	24
I	1.0000	0.5000	0.6667	2

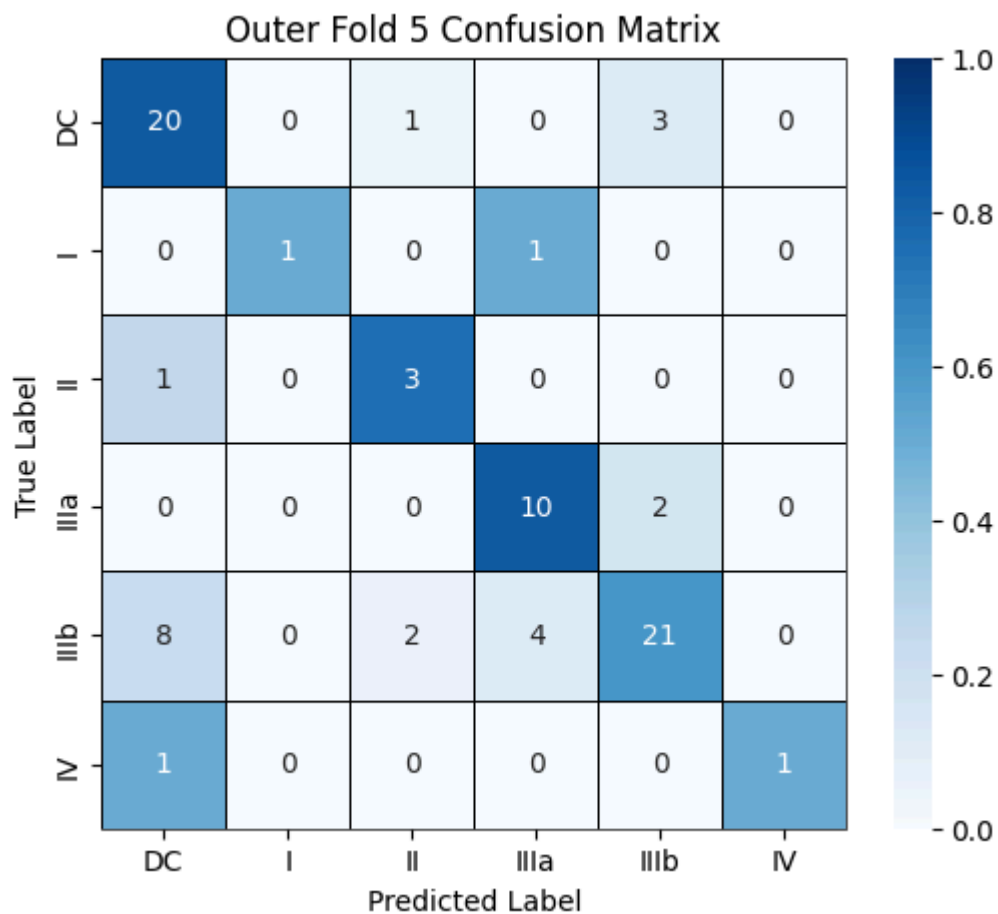
II	0.5000	0.7500	0.6000	4
IIIa	0.6667	0.8333	0.7407	12
IIIb	0.8077	0.6000	0.6885	35
IV	1.0000	0.5000	0.6667	2

accuracy 0.7089 79
macro avg 0.7735 0.6694 0.6839 79
weighted avg 0.7376 0.7089 0.7067 79

Balanced Accuracy: 0.6694444444444446

Confusion Matrix:

```
[[20 0 1 0 3 0]
 [ 0 1 0 1 0 0]
 [ 1 0 3 0 0 0]
 [ 0 0 0 10 2 0]
 [ 8 0 2 4 21 0]
 [ 1 0 0 0 0 1]]
```



===== CV SUMMARY =====

precision recall f1-score support

DC 0.6076 0.8136 0.6957 118
I 0.3333 0.6667 0.4444 12

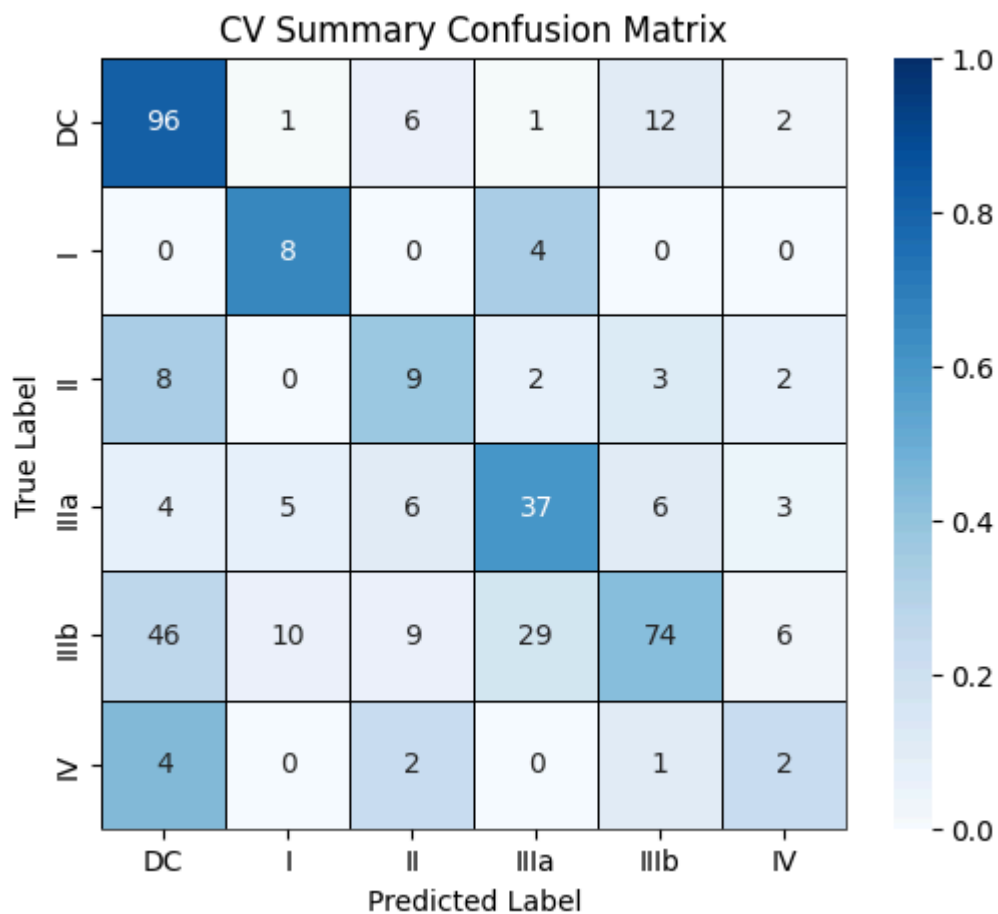
II	0.2812	0.3750	0.3214	24
IIIa	0.5068	0.6066	0.5522	61
IIIb	0.7708	0.4253	0.5481	174
IV	0.1333	0.2222	0.1667	9

accuracy		0.5678	398
macro avg	0.4389	0.5182	0.4548
weighted avg	0.6248	0.5678	0.5671

Balanced Accuracy: 0.5182154907156344

Confusion Matrix:

```
[[96  1  6  1 12  2]
 [ 0  8  0  4  0  0]
 [ 8  0  9  2  3  2]
 [ 4  5  6 37  6  3]
 [46 10  9 29 74  6]
 [ 4  0  2  0  1  2]]
```



===== REPEAT 5/5 =====

Starting 5-fold CV (3-train / 1-val / 1-test) on 398 samples...

===== Outer Fold 1 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

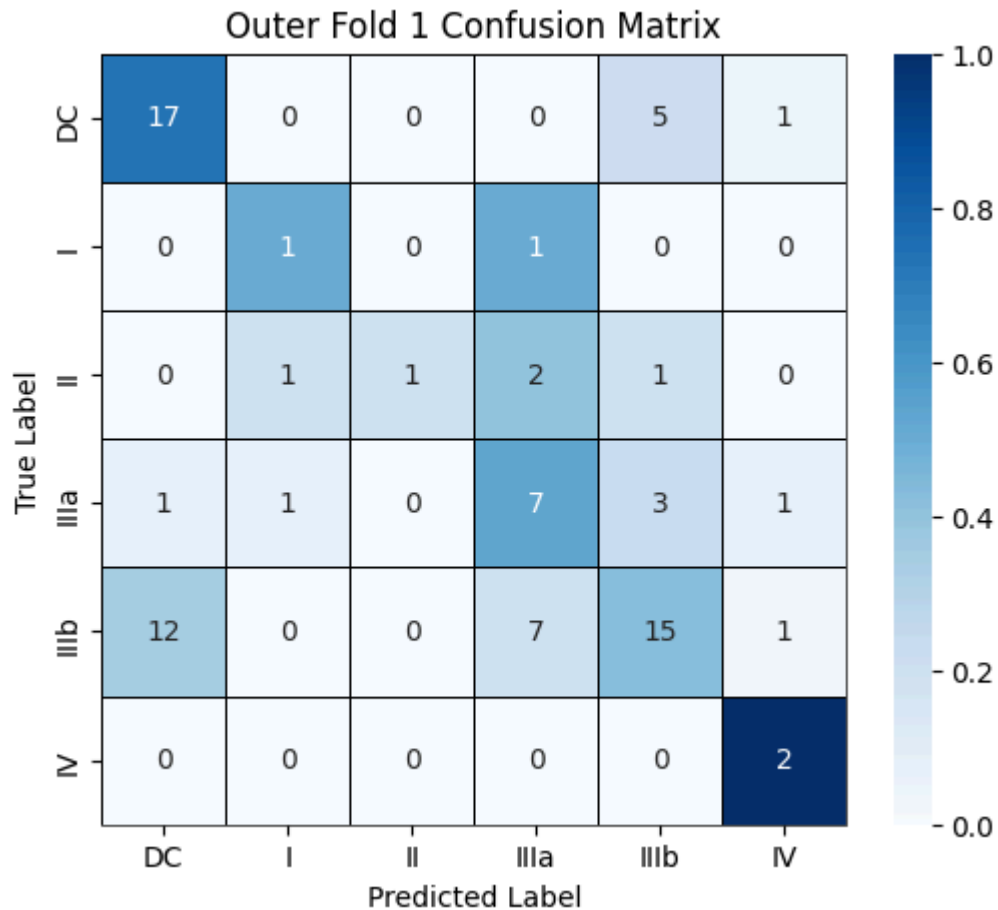
DC	0.5667	0.7391	0.6415	23
I	0.3333	0.5000	0.4000	2
II	1.0000	0.2000	0.3333	5
IIIa	0.4118	0.5385	0.4667	13
IIIb	0.6250	0.4286	0.5085	35
IV	0.4000	1.0000	0.5714	2

accuracy			0.5375	80
macro avg	0.5561	0.5677	0.4869	80
weighted avg	0.5841	0.5375	0.5278	80

Balanced Accuracy: 0.5676939003025959

Confusion Matrix:

```
[[17 0 0 0 5 1]
 [ 0 1 0 1 0 0]
 [ 0 1 1 2 1 0]
 [ 1 1 0 7 3 1]
 [12 0 0 7 15 1]
 [ 0 0 0 0 0 2]]
```



===== Outer Fold 2 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6111	0.9565	0.7458	23
I	0.1818	0.6667	0.2857	3
II	0.0000	0.0000	0.0000	5
IIIa	0.4545	0.4167	0.4348	12
IIIb	0.8000	0.3429	0.4800	35
IV	0.1667	0.5000	0.2500	2

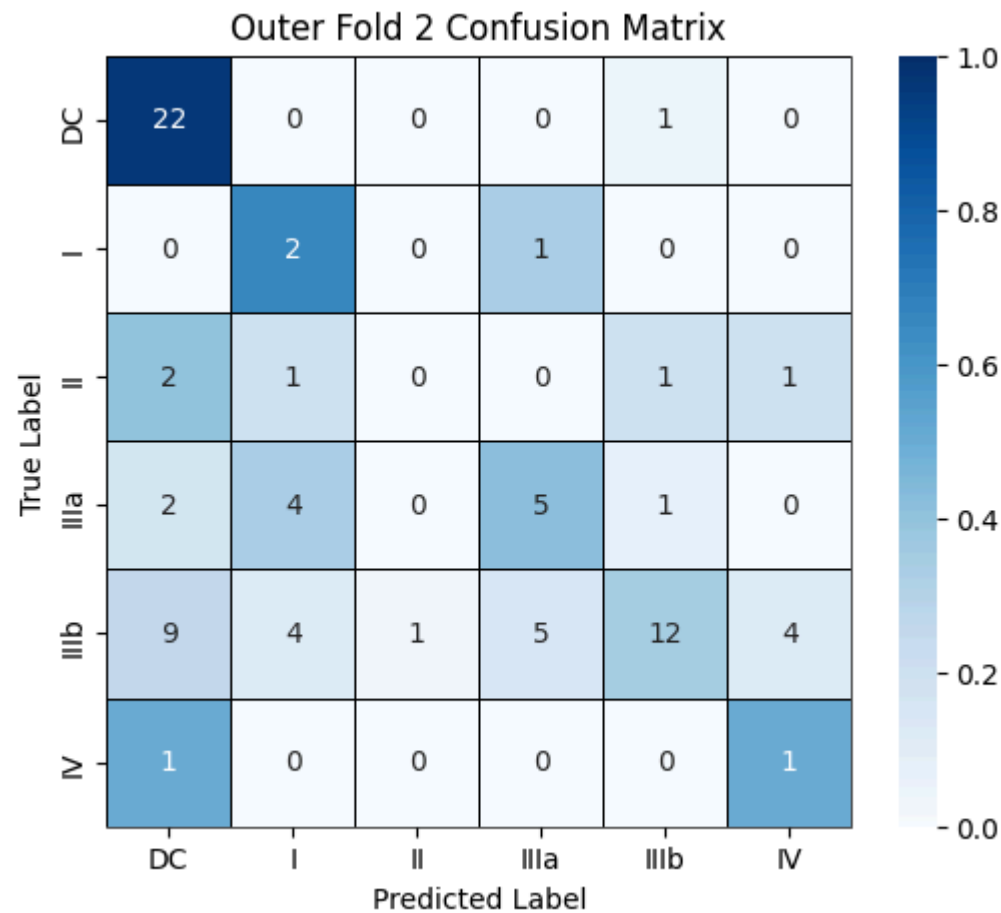
accuracy		0.5250	80
macro avg	0.3690	0.4805	0.3660
weighted avg	0.6049	0.5250	0.5066

Balanced Accuracy: 0.4804520358868185

Confusion Matrix:

```
[[22 0 0 0 1 0]
 [0 2 0 1 0 0]
 [2 1 0 0 1 1]
 [2 4 0 5 1 0]]
```

[9 4 1 5 12 4]
[1 0 0 0 0 1]]



===== Outer Fold 3 =====

These features will be dropped:

['C11', 'C101', 'MC6. DP T cells', 'C64', 'C100', 'C126', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

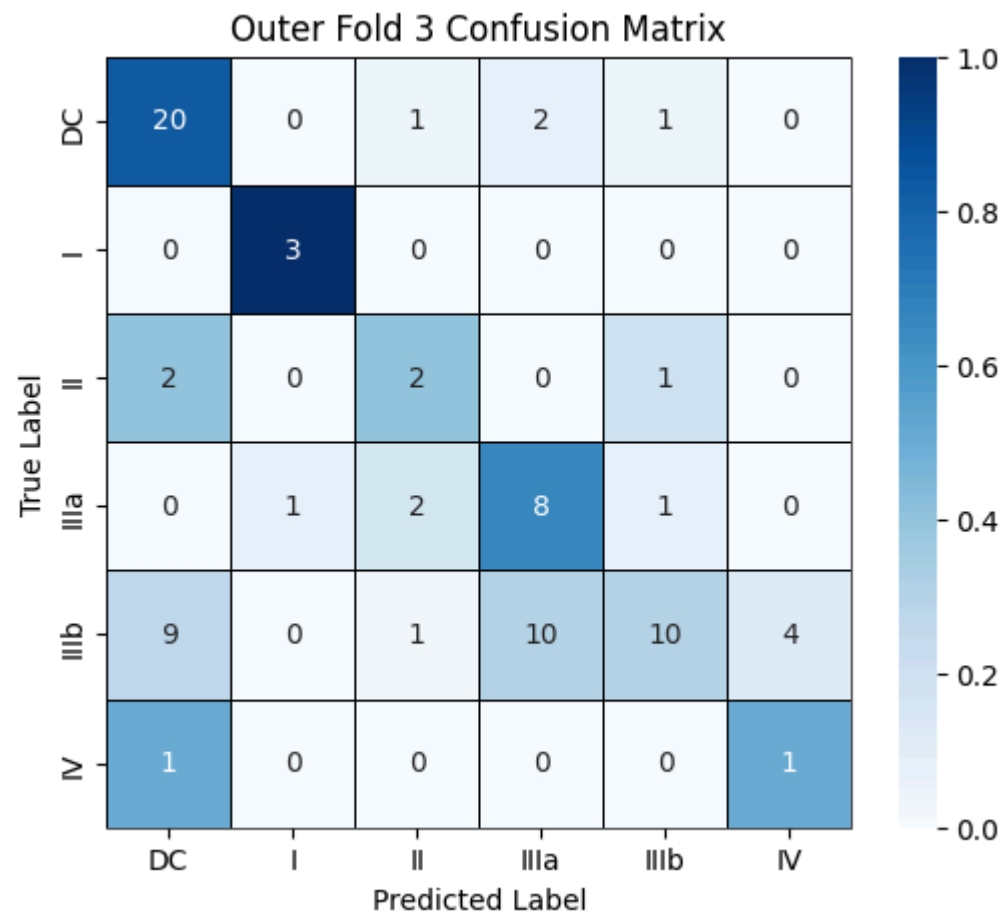
	precision	recall	f1-score	support
DC	0.6250	0.8333	0.7143	24
I	0.7500	1.0000	0.8571	3
II	0.3333	0.4000	0.3636	5
IIIa	0.4000	0.6667	0.5000	12
IIIb	0.7692	0.2941	0.4255	34
IV	0.2000	0.5000	0.2857	2
accuracy	0.5500		80	
macro avg	0.5129	0.6157	0.5244	80
weighted avg	0.6284	0.5500	0.5321	80

Balanced Accuracy: 0.6156862745098038

Confusion Matrix:

[[20 0 1 2 1 0]

```
[0 3 0 0 0 0]
[2 0 2 0 1 0]
[0 1 2 8 1 0]
[9 0 1 10 10 4]
[1 0 0 0 0 1]]
```



===== Outer Fold 4 =====

These features will be dropped:

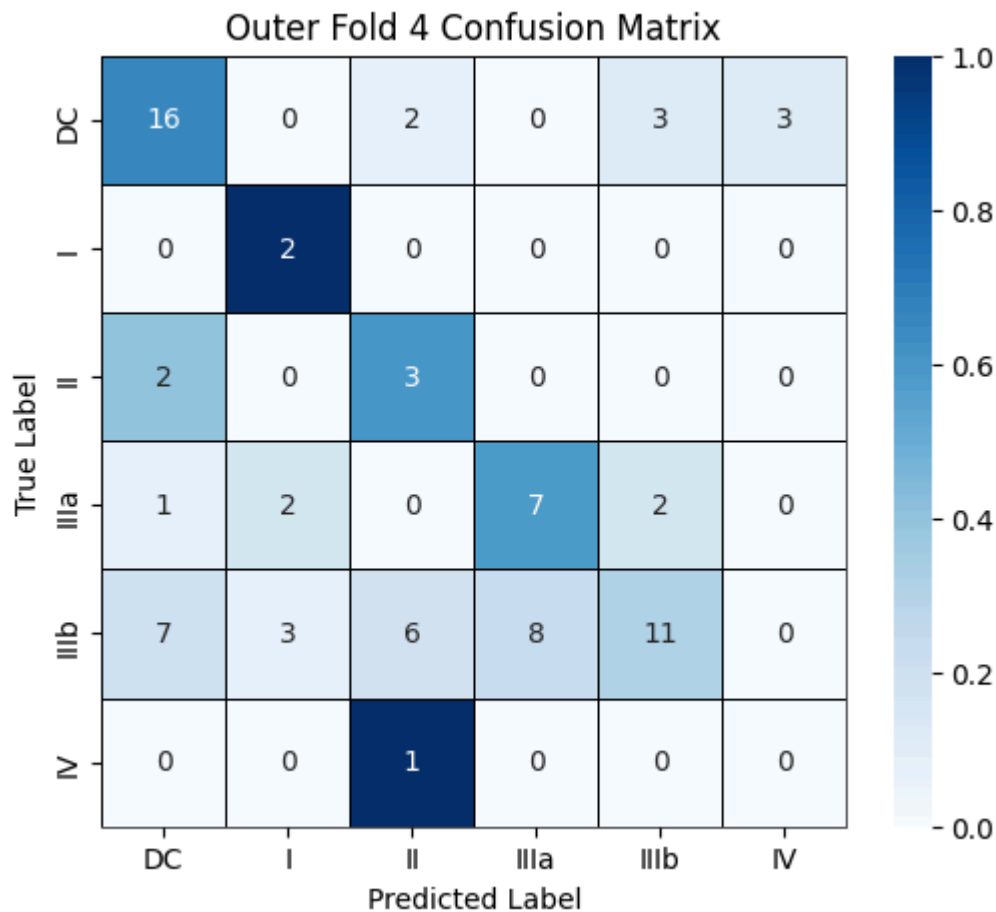
['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'C96', 'MC19. TD CD4+ T cells', 'C127', 'C51', 'C135', 'C66']

	precision	recall	f1-score	support
DC	0.6154	0.6667	0.6400	24
I	0.2857	1.0000	0.4444	2
II	0.2500	0.6000	0.3529	5
IIIa	0.4667	0.5833	0.5185	12
IIIb	0.6875	0.3143	0.4314	35
IV	0.0000	0.0000	0.0000	1
accuracy		0.4937		79
macro avg	0.3842	0.5274	0.3979	79
weighted avg	0.5855	0.4937	0.4979	79

Balanced Accuracy: 0.5273809523809524

Confusion Matrix:

```
[[16 0 2 0 3 3]
 [ 0 2 0 0 0 0]
 [ 2 0 3 0 0 0]
 [ 1 2 0 7 2 0]
 [ 7 3 6 8 11 0]
 [ 0 0 1 0 0 0]]
```



===== Outer Fold 5 =====

These features will be dropped:

['C11', 'C101', 'C64', 'C104', 'C100', 'C126', 'MC30. DN T cells', 'C82', 'C139', 'C85', 'C113', 'C87', 'C40', 'C86', 'C92', 'MC28. PreGC B cells', 'C96', 'C127', 'C51', 'C135', 'C66']

precision recall f1-score support

DC	0.6786	0.7917	0.7308	24
I	0.5000	0.5000	0.5000	2
II	0.5000	0.2500	0.3333	4
IIIa	0.5294	0.7500	0.6207	12
IIIb	0.7586	0.6286	0.6875	35
IV	1.0000	0.5000	0.6667	2

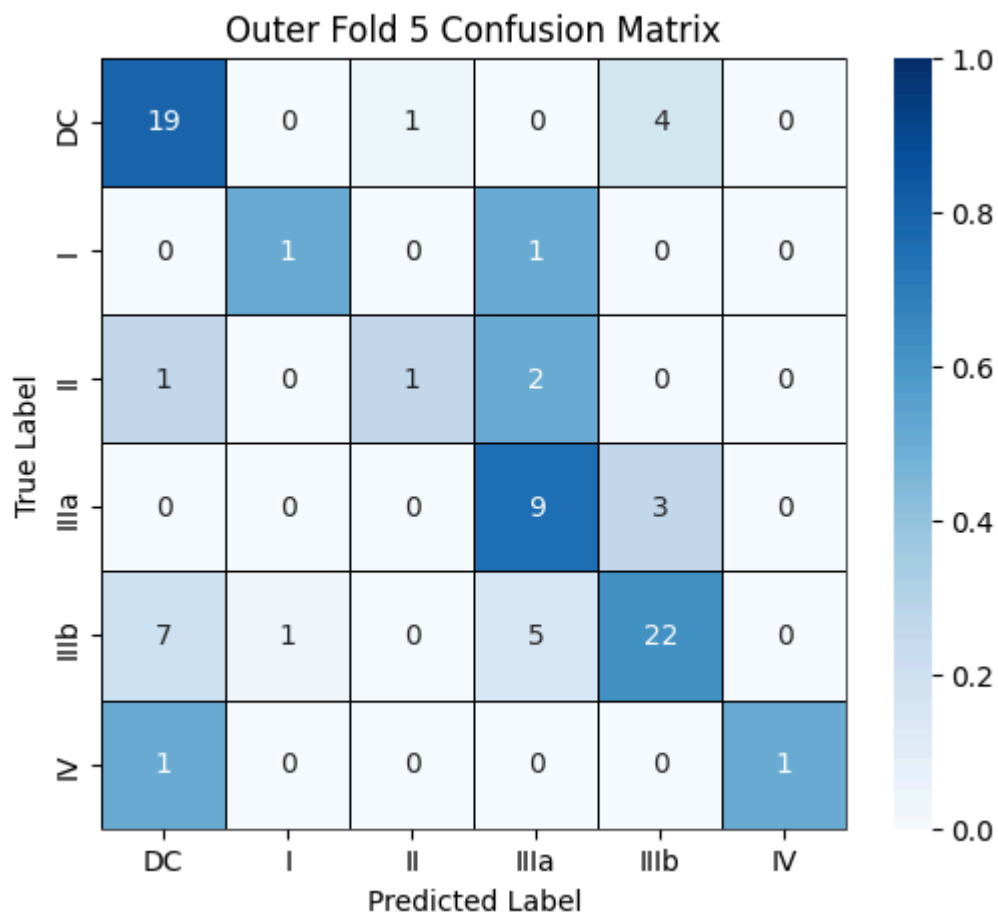
accuracy 0.6709 79

macro avg	0.6611	0.5700	0.5898	79
weighted avg	0.6860	0.6709	0.6673	79

Balanced Accuracy: 0.5700396825396825

Confusion Matrix:

```
[[19 0 1 0 4 0]
 [0 1 0 1 0 0]
 [1 0 1 2 0 0]
 [0 0 0 9 3 0]
 [7 1 0 5 22 0]
 [1 0 0 0 0 1]]
```



===== CV SUMMARY =====

	precision	recall	f1-score	support
--	-----------	--------	----------	---------

DC	0.6184	0.7966	0.6963	118
I	0.3333	0.7500	0.4615	12
II	0.3182	0.2917	0.3043	24
IIIa	0.4500	0.5902	0.5106	61
IIIb	0.7216	0.4023	0.5166	174
IV	0.2500	0.5556	0.3448	9

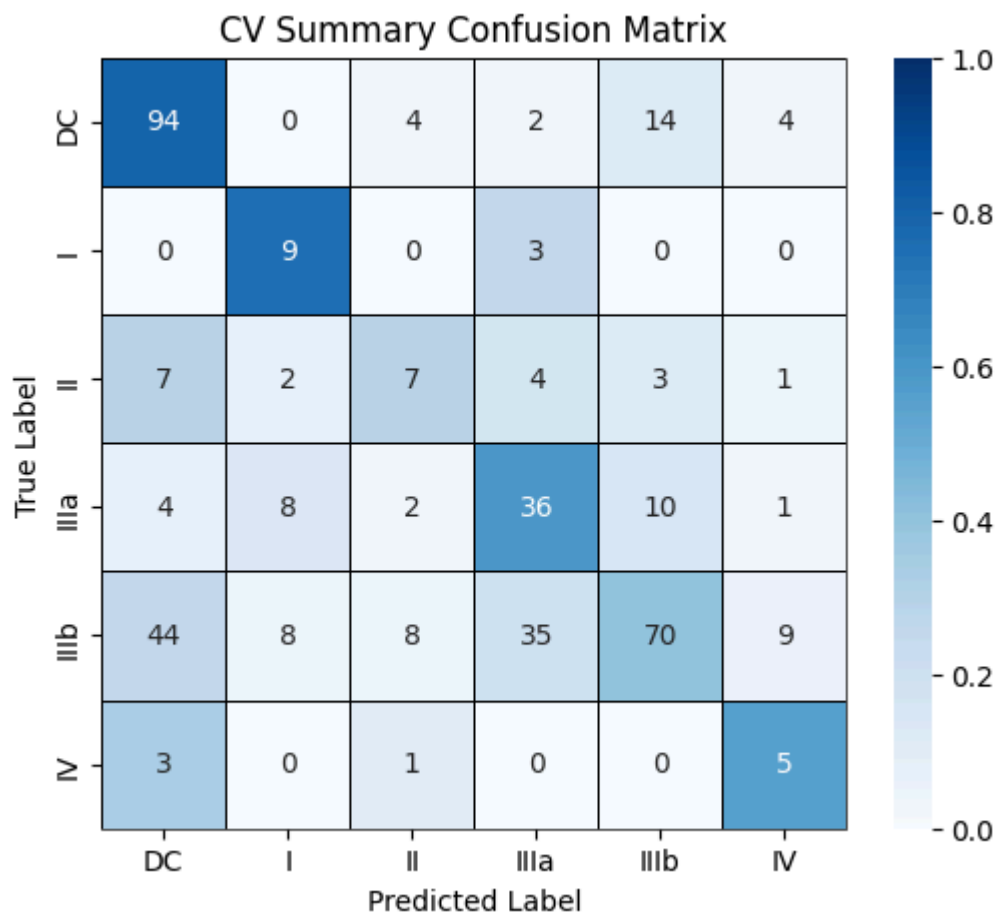
accuracy	0.5553	398
----------	--------	-----

macro avg 0.4486 0.5644 0.4724 398
 weighted avg 0.6027 0.5553 0.5506 398

Balanced Accuracy: 0.5643825294524483

Confusion Matrix:

```
[[94 0 4 2 14 4]
 [0 9 0 3 0 0]
 [7 2 7 4 3 1]
 [4 8 2 36 10 1]
 [44 8 8 35 70 9]
 [3 0 1 0 0 5]]
```



===== FINAL SUMMARY =====

All balanced accuracies: [0.5130592496425678, 0.5324362397387951, 0.5710566153433426, 0.5182154907156344, 0.5643825294524483]

0.5398300249785576 ± 0.010614058574203096

params4 = {'units': 150, 'learning_rate': 0.01, 'dropout_rate': 0.5, 'num_hidden_layers': 1, 'batch_size': 84, 'epochs': 88, 'l2_reg': 0.01, 'activation': "selu", 'optimizer': "sgd"}